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Medical Progress.

PROGRESS IN THE STUDY AND TREATMENT OF CARDIOVASCULAR DISEASE IN 1922.

BY *PAUL D. WHITE, M.D.*, BOSTON.

PART I.

During the last months of 1921 and throughout the past year of 1922 there has been steady progress in the study of cardiovascular disease. There is an enormous wealth of published material showing a wider and wider interest in investigation of the circulation, and always a certain percentage of this literature is of interest and importance. A review of the work reported during the last fifteen months has been found worth undertaking. It is necessarily brief and only those papers that have seemed to the reviewer of considerable interest are discussed below. The review is based on 258 articles out of a total of 525 papers on the subject. The review is arranged in sections as follows: (1) anatomy and physiology; (2) etiology and pathology; (3) symptoms and signs, including sounds and murmurs; (4) blood pressure; (5) x-ray; (6) further methods of study and tests of the circulation; (7) cardiography and abnormalities of the heart beat; (8) treatment, subdivided into general, surgical, and use of

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drugs, particularly digitalis and quinidine; and (9) prevention of heart disease.

ANATOMY AND PHYSIOLOGY.

Coronary Circulation. During the past year the work of Louis Gross on "The Blood Supply to the Heart," which was published in October, 1921, has received wide attention. This work was reviewed at length in this journal (BOSTON MED. & SURG. JOUR., 1922, clxxxvi, 474). One of the main points brought out by Gross was the demonstration of the rich anastomoses between the coronary arteries and between their branches, which lends support to the opinion that coronary thrombosis is fatal only when a large or vital artery is blocked, and even then the block is probably a sudden one. There are beautiful illustrations of hearts with the coronary vessels injected, some photographed by x-ray and some cleared in oil and photographed by ordinary light.

Peripheral Circulation. More attention has been paid recently to the peripheral circulation anatomically and physiologically than in the past. Bj. Vimtrup (*Klin. Wochenschr.*, 1922, i, 1696), following Krogh's work, has found that there grow on the endothelial wall of the capillaries of living larvae of the triton strongly branched cells which grasp the capillaries and cause the narrowing. G. Billard and A. Mougeot (*Presse Méd.*, 1922, xxx, 655) have stated that the walls of the small and medium arteries may become thicker and harder as a physiologic com-

pensating phenomenon in persons doing hard manual work. This salutary compensating hypertrophy of the muscular wall of the artery is not to be mistaken for arteriosclerosis. There is not the tortuosity of sclerotic vessels. Further studies on capillary circulation have been made by a number of workers, among them E. B. Carrier (*Am. Jour. Physiol.*, 1922, lxi, 1172), S. O. Freedlander and C. H. Lenhart (*Arch. Int. Med.*, 1922, xxix, 12), and C. Laubry and J. Meyer (*Arch. d. Mal. d. Coeur*, 1922, xv, 265). Carrier studied the reaction of human skin capillaries to drugs and other stimuli. He found that cold contracts the capillaries; extreme cold, however, paralyzes them and causes their engorgement. Stroking dilates capillaries. Epinephrin, from 1:1,000 to 1:10,000 solution, causes contraction; hystamin, 1:1,000 to 1:10,000, causes dilatation; pituitary extract causes contraction up to 1:100 solution; amyl nitrite dilates and urethane, 25%, dilates. He states that capillaries normally contract or dilate independently of the pressure behind them but in response to local or general stimuli. Freedlander and Lenhart made observations on the capillary circulation in many clinical conditions by Lombard's method. "In three cases of primary traumatic shock and one case of surgical shock stasis was observed in the skin capillaries. Capillary stasis was observed in several cases of septicæmia which had a sudden collapse. Capillary stasis occurs in cardiac failure and may be of some value in differentiating the preponderant factor in cardio-renal diseases. In some cases of hypertension there is a granular intermittent capillary flow." Laubry and Meyer have found that normally very great variation in capillary size occurs in a given individual from various causes, and that nitroglycerine and venous compression caused a dilatation of the capillaries. They found no evidence of capillary sclerosis in the cases of hypertension studied, nor evidence of a capillary "barrage." In anemia the capillaries looked small. These authors conclude that capillaroscopy has no clinical application.

A bibliographic review of studies on capillary circulation appeared in the *Archives des Maladies du Coeur* in June, 1922 (xv, 398-407).

Great Veins and Liver. R. Burton-Opitz (*Jour. Am. Med. Assn.*, 1922, lxxviii, 705) has studied the motor activity of the venae cavae. He controverts Connet's experimental work on the effect of epinephrin on the great veins. Burton-Opitz finds no evidence of motor mechanism in the central segments of the venae cavae. O. Hess (*Klin. Wochenschr.*, 1922, i, 2409) has recently summarized our knowledge of the position of the liver in the circulation. He claims that the liver serves an important function as a storehouse of blood and that it acts as a protection against over-distension of the right heart.

Back Pressure. The "cardio-dynamics of mitral insufficiency" have been the subject of study

by C. J. Wiggers and H. Feil (*Heart*, 1922, ix, 149). They state that "when the mitral valves are rendered insufficient in an experimental way . . . the chief backflow occurs during the phase of systolic ejection and during an interval extending approximately 0.08 to 0.09 of a second into diastole, for during these intervals intraventricular pressure is very high. By virtue of this regurgitation, systolic discharge of the left ventricle is at once reduced, and in consequence both systolic and diastolic pressures fall, pulse pressure decreasing . . . MacKenzie's conception that 'back pressure effects' are not directly caused by valvular lesions—a conception also confirmed by experiments by Bettelheim, and Kanders, McClure and MacCallum—is substantiated . . . undiminished discharge of the right ventricle . . . the excessive volume of blood is accommodated by an expansion of the left auricle and its tributaries."

High Altitude and the Heart. The effect of altitude on the work of the heart was reported at a lecture of a Lowell Institute course by J. Barcroft on February 20, 1922. The study was made in the Andes in Peru in the winter of 1921-22. The effort put forth by the heart, based on the pulse rate and the blood pressure, was considerably greater at Cerro de Pasco at an altitude of 16,000 feet than at sea level, the ratio of the index used being 1296:1088 (pulse rate times maximal blood pressure). On the other hand the work actually accomplished by the heart was very definitely less at the altitude of 16,000 feet than at sea level, 5.6 kilogram meters per minute as compared with 7.7 kilogram meters. Thus it is clear why there is a strain on the circulation at high altitudes. The oxygen pressure in the atmosphere is so low that much more work is required of the heart to accomplish the proper distribution to the tissues. Cyanosis, polycythaemia and clubbing of the fingers develop in people who live at this altitude—producing a syndrome like that found at sea level in many cases of congenital heart disease (pulmonic stenosis). The inability of patients with pronounced heart disease to live at high altitudes is thus explained.

Tachycardia and the Circulation. In one of a series of papers on the influence of circulatory disturbances on the gaseous exchange of the blood J. Meakins (*Heart*, 1922, ix, 185) has reported the oxygen saturation of the arterial blood in tachycardia. He studied five cases of auricular fibrillation from the clinic and four animals with paroxysmal tachycardia from the laboratory. He concluded "that tachycardia, whether regular or irregular, does not in itself produce a decrease in the oxygen saturation of the arterial blood, but that, if such tachycardia induces failure of the circulation and pulmonary congestion or oedema, such a decrease of oxygen saturation will follow." This same finding of no reduction in the oxygen saturation of the arterial blood was also reported in a case of

paroxysmal tachycardia by J. Barcroft, A. V. Bock, and F. J. Roughton (*Heart*, Dec., 1921, ix, 7). In their case, a man of 22 years of age, the rate rose to about 200, the systolic blood pressure fell from 120 to 100, the diastolic blood pressure rose from 68 to 80, the vital capacity dropped from 4,000 to 1,600 c.c., the minute volume of the circulation sank from 5.6 liters to 2.8-2.1 liters, and the depth of respiration was reduced to nearly half the normal value, while the respiratory rate was about doubled.

Voluntary Acceleration of the Heart. N. B. Taylor and H. G. Cameron (*Am. Jour. Physiol.*, 1922, lxi, 385) have added another case of voluntary acceleration of the heart to the 15 or 16 already on record. Atropin depressed but did not abolish the power to accelerate the pulse in this case. These authors believe that both vagal paralysis and accelerator excitation are factors, as have previous writers. The first proof that sympathetic stimulation is an important part of the mechanism of voluntary acceleration had been presented by J. Favill and P. D. White in 1917 (*Heart*, vi, 175.)

2. ETIOLOGY AND PATHOLOGY.

Incidence of Heart Disease in the Community. L. I. Dublin (*Boston Association of Cardiac Clinics, Children's Hospital*, May, 1922) has stated that about 2% of the community have heart disease, that is at least 2,000,000 cases in the United States, according to statistics of the Metropolitan Life Insurance Company. It is probable that this is too high a figure since there is generally a tendency in insurance examinations to diagnose heart disease when there may be simply irritable heart. Dublin found that of the deaths from "heart disease" in the statistics of the Metropolitan Life Insurance Company "myocarditis" was the type in 35% (mostly over 60 years of age and so probably arteriosclerotic in etiology) and "valvular" the type in 65% (mostly under 60 years of age and 25% under 30 years, probably mainly rheumatic in type with some of syphilitic origin).

Incidence of Heart Disease in the Schools. H. B. Schmidt (*Jour. Am. Med. Assn.*, 1922, lxxix, 956) writes that less than 1% of Detroit school children have organic heart disease, which corresponds well with recent statistics in some other cities. P. W. Emerson (*Boston Association of Cardiac Clinics, Children's Hospital*, May, 1922) reported that the great variation in figures received by him from various communities through the country with regard to the frequency of heart disease in the schools shows the need of more accurate and standard diagnosis. This may be secured by a closer cooperation between school physicians and nurses and the cardiac clinics now in operation in most of the large hospitals in the big cities.

Classification of Cardiac Diagnosis. To aid in the work of improvement in diagnosis P. D.

White and M. M. Myers (*Jour. Am. Med. Assn.*, October, 1921, lxxvii, 1414) have published a practical classification of cardiac diagnosis. Insistence is made that a three-fold diagnosis is essential in every case of heart disease—*first* and foremost, etiologic; *second*, structural change, and *third*, functional condition (which includes abnormalities of the heart beat and degrees of cardiac insufficiency or failure).

Arteriosclerosis. Arteriosclerotic heart and arterial disease have received further impetus for study by several reports such as that of W. C. MacCallum (*Physiol. Rev.*, 1922, ii, 70), in which he states that mechanical means alone fail experimentally to produce arteriosclerosis—additional toxic or dietary factors being necessary. L. H. Newburgh and S. Clarkson (*Jour. Am. Med. Assn.*, 1922, lxxix, 1106) have reported the production of true arteriosclerosis in the rabbit by diets containing 27% and 36% of protein. The extent of the lesion and the time of appearance were roughly proportional to the total amount of protein given. In discussion Newburgh added that Dr. Fox of Philadelphia has found that meat-eating animals show a high incidence of chronic disease of the arteries and kidneys as compared with all other animals necropsied.

R. Schmidt (*Med. Klin.*, Berlin, 1922, xviii, 6, 36) analyzed 121 cases of *angina pectoris* and found only 27 in women, and only 13 below 40 years of age. In about two-thirds of those cases where the blood pressure was recorded, the systolic reading was below 160 mm. mercury. One case with an attack of heart pain during roentgenoscopy showed no modification of the heart shadow. Eleven of his cases had had angina pectoris for over five years. R. Ehrmann (*Med. Klin.*, 1922, xviii, 1431) called attention again to the familial type of early severe arteriosclerosis.

The effect of *occlusion of the coronary arteries* has been discussed in an interesting paper by W. T. Longeope (*Wis. Med. Jour.*, 1922, xx, 449). He wrote that immediate or almost immediate death probably results from sudden stoppage of the circulation in either coronary artery which is otherwise normal. Occlusion either by thrombosis or by sclerosis of a diseased coronary may be compatible with life for varying periods of time. In most cases Longeope states that there are significant symptoms and signs that frequently permit a fairly accurate diagnosis: severe pain, transient pericardial friction rubs, acute onset of myocardial insufficiency and various forms of tachycardia and cardiac arrhythmia in an elderly person without signs of valvular heart disease as a rule. A Lemierre and R. Piedelievre (*Bull. de la Soc. Méd. des Hôp.*, December, 1921, xlv, 1577) reported the case of a laborer of 52 years with epigastric pain for five days with fever and chills and sweating. He was symptomatically better, when

he died suddenly. Autopsy showed a ruptured left ventricle.

Rheumatic Heart Disease. Rheumatic heart disease has as usual received a good deal of attention. Of most importance are the papers of W. St. Lawrence (*Jour. Am. Med. Assn.*, 1922, lxxviii, 947 and 1922, lxxix, 2051), who reported first a study of 65 cases of so-called potential heart disease, and second, an investigation of 100 families of individuals with rheumatic heart disease. The 65 cases of potential heart disease were children with rheumatic fever or chorea without evident heart disease when first observed. They were followed continuously for an average of four and a half years; 49 of them (75%) remained free from demonstrable heart disease during this time. Of 25 patients with well-treated acute rheumatic fever in the series none contracted a lesion in the heart. In every case in which heart disease developed chorea had occurred in a severe form. Of 41 patients with chorea in the series, 16, or 39%, contracted a heart lesion. A year or more may elapse between the original infection and the appearance of mitral stenosis; it is thus impossible to declare the heart unaffected at the conclusion of an attack of acute rheumatic fever or chorea.

Of greater importance than this study is the second paper by St. Lawrence on "the family association of cardiac disease, acute rheumatic fever and chorea." An investigation of 100 families, including 626 individuals, showed that 50% of them had two or more members affected by "rheumatic" infection, which was actually 2% higher incidence than in the case of a similar study of tuberculosis in 100 families; 14.8% of 480 exposed persons gave evidence of rheumatic infection. One additional point of interest to be pursued further was that "occasionally, cases of congenital heart disease have been observed in which the mother had acute rheumatic fever during the period of the child's gestation."

Rheumatic myocarditis is the title of a pathological report by P. F. Holst (*Norsk Mag. f. Laeg.*, December, 1921, lxxxii, 833). Four of seven rheumatic hearts showed well the submiliary nodules of Asehoff without bacteria. Holst insists (and rightly I believe) that rheumatism is a chronic infection with nests where the virus may hibernate. For that reason he advises giving periodic courses of specific salicylic medication in such cases without waiting for an acute attack to develop. Thirty-seven hearts from patients with rheumatic infections were examined by C. F. Coombs (*Quart. Jour. Med.*, Oxford, 1922, xv, 114) and in 18 of these submiliary nodules were found in the myocardium.

The frequency of rheumatic heart disease in hospital out-patient cardiac clinics is illustrated by a brief analysis made of the first five hundred cases at the Boston City Hospital Clinic by B. E. Hamilton and J. E. Hallisey (*BOSTON MED. & SURG. JOUR.*, 1922, clxxxvii, 139). Rheu-

matic heart disease was found in 202 and "potential" rheumatic heart disease was considered present in 45—a total of close to 50%—as compared with 26 cases of arteriosclerotic heart disease, 26 cases of cardiovascular syphilis, heart changes with hypertension 19, congenital heart disease 19, no heart disease 69, effort syndrome 40, and the balance miscellaneous cases. Two observations of considerable interest and importance made by Hamilton and Hallisey are that probably "many ambulatory rheumatic heart disease cases have a low grade active infectious process at work in their hearts" to account for their steady downward course, and that aortic regurgitation is mostly rheumatic. The statistics of this group are very similar to those of 600 hospital cases published by R. C. Cabot in 1914 (*Jour. Am. Med. Assn.*, 1914, lxiii, 1461); both undoubtedly fail to represent the true incidence of types of heart disease in the community at large since without much doubt arteriosclerotic heart disease is considerably more frequent in the country than is rheumatic heart disease. Its victims, however, considering themselves simply crippled by old age, do not often consult hospital clinics or indeed even their own private physicians until they are quite ill. Ormhaug (*Norsk Mag. f. Laeg.*, December, 1921, lxxxii) found antecedents of acute articular rheumatism in 44% of 288 men and in 57% of 289 women with heart trouble.

Cardiovascular Syphilis. A. S. Warthin (*N. Y. Med. Jour.*, 1922, cxv, 69) again emphasizes the frequency of the involvement of the arteries in syphilis. He writes as follows: ". . . Nowhere in the critical literature of the day do we find any definite statements made concerning syphilis of the arteries other than that of the aorta, cerebral and coronary arteries . . . Simple arteriosclerosis (hyaline thickening of the intima) of the medium and smaller arteries is more common in syphilites than in non-syphilites. It is probably not due to the localization of spirochetes in the intima, but is of secondary origin (toxic or mechanical). Syphilitic periarteritis, panarteritis and arteritis obliterans of the smaller arteries occur in all cases of chronic and latent syphilis, in greater or less degree. Syphilitic mesoarteritis is essentially a disease of the arterial vasa vasorum. Syphilitic lesions of the smaller arteries are always associated with localization of the infection in any organ or tissue. The lesions are rarely gummatous in character." Ormhaug (*Norsk Mag. f. Laeg.*, December, 1921, lxxxii) reports that he has found syphilis apparently responsible for heart disease in 17% of men and 6% of women in 1064 observations with necropsies. In 37 cases of aortitis S. B. E. Campbell (*Edin. Med. Jour.*, 1922, xxix, 109) discovered a positive Wassermann reaction in 28 and in 3 others a positive luetic history. In the cadavers of 10 infants with congenital syphilis grave aortitis was found in 3 by F. Thoenes

(*Ztschr. f. Kinderheilk.*, 1922, xxiii, 113.) A. Nanta (*Arch. d. Mal. d. Coeur*, 1922, xv, 605) reported a case of auricular fibrillation in the heart of a patient with tabes. He considered this arrhythmia rare in such hearts and quotes the finding of Heitz in 1903 of only 2 cases in 98 tabetics examined.

Two papers of interest have been published with regard to the treatment of syphilis of the heart and aorta. U. J. Wile (*Am. Jour. Med. Sci.*, 1922, clxiv, 415), although ardently in favor of the use of arsphenamine in the treatment of syphilis, believes that it should not be used routinely in the treatment of cardiac syphilis. He states that much more suited for treatment of cardiovascular as well as other forms of visceral syphilis are mercury and the iodides, whose action is slow and hence more desirable. L. Gallavardin (*Jour. Méd. franç.*, December, 1921) has called attention again to the important fact that in spite of a moderate anti-luetic treatment in cases of specific aortitis he has never seen a murmur of aortic insufficiency disappear, and in 2 patients he has actually observed such a murmur develop in spite of treatment.

Hypertensive Heart Disease. There has appeared little in the literature with this exact title, but it is a frequent type and several papers of interest on hypertension will receive comment under the heading of blood pressure. It is of considerable note that no paper of importance has been published on "cardiorenal disease," a term rapidly losing caste.

Thyroid Heart Disease. The entity of thyroid heart disease is becoming more and more widely recognized with the development in chronic cases of hyperthyroidism of cardiac hypertrophy, auricular fibrillation, at first paroxysmal, and congestive failure. Before the onset of failure these patients with auricular fibrillation, either paroxysmal or constant, are probably favorable subjects for the use of quinidine sulphate. B. E. Hamilton and F. H. Lahey (*Jour. Am. Med. Assn.*, 1922, lxxviii, 1793) have written on the differentiation of hyperthyroidism and heart disease from neurasthenic states. As a result of a study of the cases in the out-patient clinics at the Boston City Hospital they state that 30% of the patients referred to the thyroid clinic are not thyroid but come under the class of neurasthenia just as 30% of the cardiac clinic cases are not cardiac but belong in the same group. J. M. Read (*Jour. Am. Med. Assn.*, 1922, lxxviii, 1887) has attempted a correlation of the basal metabolic rate in hyperthyroidism with the pulse rate and the pulse pressure. He states that the pulse pressure and the pulse rate vary in the same direction as the basal metabolic rate, which may be roughly guessed without the absolute need of doing basal metabolism tests in every instance.

Congenital Heart Disease. Two bibliographic reviews of recent articles on congenital heart dis-

ease have appeared during the year in the *Archives des Maladies du Coeur*. Numerous articles were summarized in March, 1922 (xv, 165-174) and in June, 1922, the same journal reviewed 12 recent articles (xv, 452-455). Two more cases of probable congenital heart block have been reported during the year, one by J. B. y Frias (*Arch. Espan. d. Pediatría*, 1922, vi, 449) and the other by Barbier, Lebée and Mouquin (*Soc. de Péd.*, January, 1922). This is a very rare condition and prior to this year only 12 cases proven by graphic records have been reported (White, P. D., Eustis, R. S., and Kerr, W. J.: *Am. Jour. Dis. Child.*, 1921, xxii, 299). The case of Frias was in a girl of 5 years of age, and the other case was one of complete heart block coexisting with an interventricular septal defect in a boy of 15 years. A curious anomaly has been reported by R. O. Brigham (*Ohio State Med. Jour.*, 1922, xviii, 484), in which the aortic arch was right sided, the first such case observed in 1400 cadavers dissected at the University of Michigan. The heart was normal and no other viscera were displaced or transposed. The innominate artery was on the left. The subject was a man of 50 years of age.

Diphtheritic Heart Disease. C. Schwensen (*Jour. Inf. Dis.*, 1922, lxxviii, 279) reported that of 568 patients with diphtheria examined, of whom 118 were very sick, clinical signs of acute myocarditis were found in 17% of the total number and in 75% of the grave cases. When organic heart block appeared early the patient generally died. He also stated that only 14% of those patients who recovered showed premature beats during the disease, while 81% of the patients with apparent heart involvement showed them. When he reexamined the patients over 2 years after their discharge he states that signs of impairment of the heart were found in more than two-thirds of those who came to be reexamined. His conclusion is, therefore, that diphtheria must be considered an important cause of heart failure later in life. There were 66 patients who returned for reexamination and in 46 of these Schwensen discovered symptoms and signs of mitral involvement. If this finding is the basis for his conclusions, it would be necessary to know in more detail what is meant by him as mitral regurgitation.

Tuberculosis of the Heart. There have appeared during the past year a few papers of interest on this subject. E. Weiss (*Arch. Int. Med.*, 1922, xxix, 64) reports two new cases of tuberculosis, the first in a negro of 25 whose heart and pericardium were infiltrated with large tubercles, and the second a man of 25 who showed extensive pericarditis but no invasion of the myocardium. He refers to the study made by Norris of 7219 necropsies; in this group 1780 were found to have tuberculosis and among these 82 cases of tuberculous pericarditis were found with involvement of the heart muscle in 5. He also refers to a paper by J. M. Anders on tuber-

culosis of the myocardium (*Jour. Am. Med. Assn.*, 1902, xxxix, 1081) who summarized 71 cases of tuberculosis of the myocardium and added a case of his own. Weiss states that reference to the literature indicates that the heart involvement is almost always secondary to disease of the mediastinal lymph nodes. B. Korybut-Daszkiewicz (*Arch. de Méd. des Enfants*, 1922, xxv, 150) has summarized the cases of tuberculosis of the heart on record and reported a new case in a male infant 20 months of age with a fatal rupture of the heart due to tubercular aneurysm at the apex. R. Massini and W. Lüscher (*Schweiz. Med. Wchnschr.*, December, 1921) have reported 3 cases of tuberculosis of the myocardium, one in a man of 30 and 2 in women of 45 and 68. E. Lenoble (*Arch. d. Mal. d. Coeur*, 1922, xv, 15 and 20) has reported a case of extensive pulmonary tuberculosis and tuberculosis of the mitral valve and of the myocardium, and another case of pulmonary tuberculosis with a bloody pericardial effusion and microscopic tubercles in the myocardium. A. Latham (*N. Y. Med. Jour.*, 1922, cxv, 209) refers again to the interesting fact that in patients suffering from mitral stenosis pulmonary tuberculosis rarely develops, apparently because of the protective influence of the pulmonary hyperemia.

Subacute Bacterial Endocarditis (Malignant Endocarditis). The importance of the recognition of subacute bacterial endocarditis has been emphasized by P. Morawitz (*Münch. Med. Wchnschr.*, November, 1921, lxviii, 1478). He states that 19 cases have come to his attention in two or three years, only two or three previously correctly diagnosed, most of them having been diagnosed tuberculosis or anemia. The important signs are remittent fever, tumor of the spleen, anemia and heart murmurs. There may be hemorrhagic focal nephritis. J. E. McCartney (*Jour. Path. & Bact.*, 1922, xxv, 277) reported a case of acute ulcerative endocarditis in a child aged 3½ weeks. E. Libman (*Trans. Assn. Am. Phys.*, 1922, xxxvii, 233) has discussed the characterization of various forms of endocarditis. He states that "it is interesting to speculate on the probable great frequency of subacute bacterial infection of the valves of the heart with complete recovery in cases in which there is no history of the active infection. We have shown that cases with positive blood cultures may undergo complete recovery and have drawn attention to the occurrence of cases coming to us with sequelae of the disease in which there is no history of the active bacterial stage of the disease (we have seen at least 50 such cases). . . . During the last year we have made the novel observation that recurrences of the disease exist. Thus far 4 such cases have come under observation. . . . It is evident that the disease which was considered rare, subacute bacterial endocarditis, is now recognized as one of the common diseases. Of great interest

is the change in our viewpoint. Formerly it was supposed to be a practically uniformly fatal disease; now we are observing more and more partial or complete recoveries. We find that very mild cases exist and that there is a recurrent form of the disease. . . . It will be of the greatest value if an active campaign is undertaken for the purpose of preventing the disease."

An interesting report has been made by W. C. Richey and W. W. G. MacLachlan (*Arch. Int. Med.*, 1922, xxix, 131) of mycotic embolic aneurysms of peripheral arteries in subacute bacterial endocarditis as an arterial manifestation of the disease. The first case was a man of 38, who showed a ruptured aneurysm of the superior mesenteric artery. The second was a man of 39, who showed an aneurysm of the posterior tibial artery.

J. A. Capps (*Trans. Assn. Am. Phys.*, 1922, xxxvii, 315) has brought up again the question of the arsenical treatment of chronic infectious endocarditis. Of eight cases proven by blood cultures, treated with daily injections of sodium caecodylate (usually intravenously) continued over a period varying from 7 weeks to 4 months, 2 died and 6 have survived. The 6 surviving cases have been studied over periods of 11 years and 6 months, 5 years and 1 month, 5 years, 2 years and 1 month, 6 months and 3 months, respectively. The dosage of sodium caecodylate was 1 to 4 grains. The drug was pushed until a strong garlic odor was expelled with the breath. Capps states that it is advisable to make a fresh preparation every few days of a reliable drug. *Streptococcus viridans* was the organism found in all cases.

A bibliographic review of papers on subacute (or malignant) endocarditis has appeared in the *Archives des Maladies du Coeur* in June, 1922 (xv, 436-444). An interesting and important review of the subject of subacute bacterial endocarditis is to appear shortly in *Medicine* (1923, II), written by G. Blumer.

Gonococcus Infection of the Heart. W. S. Thayer (Johns Hopkins Hosp. Bull., 1922, xxxii, 361) has added three cases of gonococcal heart disease to the 32 with autopsies which he collected from the literature in 1899 (*Jour. Exper. Med.*, 1899, iv, 81); 11.3% of 176 instances of acute endocarditis of determined origin at the Johns Hopkins Hospital were gonorrhoeal. In a paper on the cardiae complication of gonorrhoea (*Trans. Assn. Am. Phys.*, 1922, xxxvii, 248) Thayer states that gonorrhoeal septicæmia with every evidence of endocarditis is not necessarily fatal. He quotes cases reported by a number of authors. "Aortic valves are those most commonly involved, but, as in all acute endocarditides, the right side appears to be affected more often than in the chronic so-called rheumatic valvular disease. In our experience involvement of the pulmonary orifice has been rather common. . . . Mural endocarditis is

frequent. . . . Gonorrhoeal cardiac infections as a whole are by no means very unusual." A full table of references is appended to this paper. G. Lion and M. Levy-Bruhl (*Arch. d. Mal. d. Coeur*, 1922, xv, 289) have reported a new case of gonococcal endocarditis to be added to the 50 cases that they had found in the literature. Three references to fatal gonococcal endocarditis appeared in the Analytical Review of the *Archives des Maladies du Coeur* (June, 1922, xv, 438 and 440).

Influenzal Endocarditis. J. B. Cohen and D. Greenberg (*Jour. Am. Med. Assn.*, 1922, lxxviii, 1382) have reported a case of subacute malignant influenzal endocarditis. The blood culture was twice positive for influenza bacilli. Post-mortem examination showed fresh vegetations on the valve cusps. The authors report that Libman considers 5% of malignant endocarditis to be influenzal.

Tumors of the Heart. H. J. Goldstein (*N. Y. Med. Jour.*, 1922, exv, 158) has reviewed the reported cases of tumors of the heart, 150 with primary tumors, 40 of these with sarcoma. He reports himself one case of primary sarcoma, 7 cases of metastatic sarcoma and 2 cases of secondary carcinoma of the heart and pericardium.

Miscellaneous Conditions. H. W. Mills (*Surg., Gyn. & Obst.*, 1922, xxxv, 455) has reported a case of hydatid cyst of the heart with metastatic infection of the right lung.

W. Thalhimer (*Arch. Int. Med.*, 1922, xxx, 321) has written on the mechanism of the development of non-bacterial chronic cardio-vascular disease. He considers that diseases of childhood—scarlet fever, measles, tonsillitis and so on—may cause toxic damage to the valves, later resulting in slight but mild fibrosis. Therefore, he considers erroneous the idea that all of these chronic lesions are the result of the direct action of bacteria.

The effect of *trauma* on the heart has been summarized by P. D. White (*The Nation's Health*, 1922, iv, 553). He has quoted the work of Barié, who reported 38 cases of ruptured valves in 1881, and that of Raneletti, who found in 1910 in the literature reports of 49 cases of rupture of the aortic valve, 27 of the mitral, two of the tricuspid and one of the pulmonary. Enough autopsies have been reported to show that valve ruptures may occur in fairly normal hearts, although naturally aortic sclerosis and syphilis predispose to rupture. In the case of mitral valve rupture, endocarditis, sometime malignant, has nearly always been present. Rupture of auricular and ventricular walls and aorta are much more common than rupture of the valves and have been reported frequently. "Although the healthy ventricle, auricle or aorta may be torn if sufficient pressure, almost invariably the result of external trauma, is exerted on it when distended with blood, it is quite certain that such rupture is far more apt to occur if the

heart wall or aorta is diseased as in cardiosclerosis or aortic aneurysm."

White (*loc. cit.*) has stated with reference to the problem of *heart disease in industry* that there is no such entity as industrial heart disease, that "cardiac symptoms and signs in the industrial worker are the result almost invariably of nervous fatigue or effort syndrome, or of damage by rheumatic fever, syphilis, arteriosclerosis, high blood pressure or hyperthyroidism and rarely result from accidents, such as wounds to the heart, a blow on the chest or unusual physical strain." Another paper on "The Problem of Heart Disease in the Industrial Worker," by P. D. White (*Jour. Indust. Hyg.*, December, 1921, iii, 219) insists that heart disease and industry are not incompatible. "The active trained mind of a cardiac cripple may be more valuable in industrial progress than a body in perfect health controlled by a dull intellect." R. J. Wolvius (*Nederland. Tijdschr. voor Geneesk.*, October, 1921, ii, 1680) has reported the rupture of an aortic valve in a healthy soldier of 20 years of age on a sudden lifting of a great weight.

C. Aubertin (*Ann. d. Méd.*, December, 1921, x, 454) has added two new cases of *thrombosis of the aorta* to the 32 that he has found on record. In 18 of the cases there was symmetrical gangrene of both legs. Pain in the feet and calves was the chief symptom. P. Bull (*Acta Chir. Scand.*, 1922, liv, 315) has reported that there have been found in over six thousand autopsies thrombosis in the heart in 234 cases, in the aorta in nine cases, and embolism in arm or leg in 15 cases. The cardiac thrombosis was found on the right side in about one-third, on the left side in about one-third, and on both sides in the remaining third. Embolism was found in all the cases with cardiac thrombosis except 48; in the lungs in 113 patients, in the kidneys in 74, in the spleen in 60, in the brain in 32, in the intestines in 6, in the limbs in 15, and in the liver in one.

Pericarditis. A. L. Barach (*Am. Jour. Med. Sci.*, 1922, clxiii, 44) has discussed the question of pericarditis in chronic nephritis with a report of 30 cases. These patients showed marked nitrogen retention in the blood, high blood pressure and anemia. The average duration of life was 16 days. The majority of cases were probably non-infectious. M. H. Fussell and J. A. Kay (*Am. Jour. Med. Sci.*, 1922, clxiii, 40) have reported symptoms of appendicitis in three children with acute pericarditis. C. A. Hedblom (*Minn. Med.*, 1922, v, 40) has discussed the treatment of pericarditis with effusion. Nine cases were aspirated at the Mayo Clinic, four serous, four purulent and one hemorrhagic.

Aneurysm. A number of reports of unusual cases of aneurysm have appeared in the literature during the past fifteen months. M. Pincherle and D. Volta (*Rev. di Clin. Ped.*, October, 1921, xix, 577) have reported the finding of

two aneurysms in the aortic arch of a boy seven years old. They have reviewed 100 cases of aortic disease in children due to lues, rheumatism and other infections. G. Blechmann and A. Paulin (*Arch. d. Mal. d. Coeur*, 1922, xv, 472) have reported the case of a girl of seven years of age with the infundibular type of pulmonary stenosis and interventricular septal defect with aneurysm of the pulmonary artery as the result of pneumococcus ulcerating endocarditis and arteritis. R. Hutchison (*Brit. Jour. Child. Dis.*, 1922, xix, 85) has reported the sudden death of a girl of six years of age from rupture of an aneurysm of the ductus arteriosus into the lung. M. H. Kahn (*Am. Jour. Med. Sci.*, 1922, clxiii, 839) has reported two almost identical cases of aneurysm of the left ventricle with precordial distress, congestive failure, abnormal electrocardiograms, obstruction of the descending branch of the left coronary artery and apical pericardial adhesions. He presents a brief review of the recent literature on cardiae aneurysm. W. O. Ott (*Ann. Surg.*, November 1921, lxxiv, 513) has reported the results of surgical treatment of 21 cases of peripheral aneurysm. He considers double ligation and excision of the sac preferable to the method of gradual occlusion with clamps. Finally R. L. Tuffier and associates (*Arch. Franco-Belges de Chir.*, October, 1921, xxv, 54) made for a fusiform aneurysm of the ascending aorta a compressing sheath from a square sheet of fascia lata. The lumen of the aorta was restored to normal size and x-rays showed five and six years later an aorta of approximately normal outline.

(To be continued.)



PROGRESS IN GYNAECOLOGY.

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THE literature on gynaecology during the past year has been gone over and an attempt made to chronicle any new or progressive things that have been reported in such a way that the reader may determine whether or not they are of interest to him. It would consume too much space to make each matter complete, so a bibliography of the leading articles is appended for reference.

Vulvovaginitis in children is on an uncertain basis at present. Paine¹ says that many observers consider vulvovaginitis as being practically always gonorrhoea. In order to decide this he studied 91 cases, of which 10 per cent. had positive smears. He believes that half of the rest are due to infections with bacteria that ordinarily produce colds, nasal infections, etc., and that the remainder are due to masturbation or

lack of cleanliness. In order to settle this same question Stein² sent out a questionnaire to several hospitals and physicians, and found that there was no unanimity of opinion as to the frequency or treatment. He studied 49 cases of vulvovaginitis, of which 15 (30 per cent.) had positive smears. Of these 15, cultures were positive from 7, and negative from 8. Of the 49, eight were suspicious clinically but had negative smears and cultures. The other 26 had negative smears and cultures. In the treatment of vulvovaginitis both Stein and Paine lay stress on personal cleanliness, the former prescribing a tub bath every day. As regards drug treatment, Stein uses 1% mercurochrome 220 in lanolin and vaseline injected into the vagina, corresponding to Gellhorn's 1% silver nitrate introduced in the same base. With this the gonorrhoeal cases were cured in an average of 9.7 weeks, the suspicious cases in 6.5 weeks, and the nongonorrhoeal in 5 weeks. Norris and Mikelberg³ studied 74 cases of gonorrhoea in children. Tubal infections are rare because the infection tends to ascend at menstruation and labor. They believe that its chronicity and tendency to recur are due to undetected areas of infection in the vagina. This is examined by means of a Kelly cystoscope after the acute symptoms have subsided, and treated with Dakin's solution 0.57% in olive oil at first, and later with mercurochrome. Twelve weeks was the average duration of treatment for cure. If the case relapses, as 8 did, they advise drying the vagina thoroughly with hot air and keeping the cystoscope in for 20 minutes with the vagina ballooned in the Sims' position and then applying mercurochrome. This is done 3 times a week besides home treatment with mercurochrome or Dakin's solution on the part of the mother. The reasons for this are that gonococci die at room temperature, the ballooning smooths out the wall, allowing a better application of the drugs, and exposure to air tends to develop mature epithelium, which is resistant to the germ.

The treatment of gonorrhoea in adult women is also not standardized. Following the hot bath treatment, the idea of which was to raise the body temperature to above 41° C., which theoretically would kill the gonococcus, but which proved to be too severe, causing collapse in a good many cases, methods of raising the temperature locally alone have been devised. Von Buben⁴ uses an electrode, 3 centimeters by 2 centimeters, which is hollow and contains a thermometer. It is placed in the vagina twice a week for 15 to 20 minutes each time, the temperature being raised to 46° C. He treated 110 cases of gonorrhoea which had shown no improvement under previous treatment, and reports 78% of cures at the end of 10 treatments on the average. Kyaw⁵ uses heat by applying the electrode in the rectum and the thermometer in the vagina, using a temperature up to 44° C.

for a minimum of 3 hours at a sitting. He prefers to do the cure in one day, from 8 to 1 and from 3 to 7 o'clock, 9 hours altogether, and if no gonococci are demonstrable after 3 days the patient is considered cured. Frank⁶ also uses heat in similar ways. The theory of using heat seems to be sensible, for it is known that a temperature of 41° C., for 1 hour, kills gonococci experimentally, and also it is known in Africa that cases of gonorrhoea are cured after the afflicted person has an attack of "black water fever," for in that disease the body temperature remains high for 8 days (Kyaw). It would seem as if the actual treatment must be very severe, as 44° C. is 111.2° F. Guthmann⁷ uses a water-cooled lamp which causes a hyperaemia in the cervix. Combining this with drug treatment, he gets a gonococcus-free cervical secretion in a few weeks, even in chronic cases. This treatment causes an increased hyperaemia with more phagocytic activity, as well as an augmented amount of cervical discharge, which results in mechanical washing of the canal. Young⁸ accomplishes the same result by means of a glass tube fitted over the end of the cervix and connected with a suction apparatus, applying the suction intermittently.

An important observation in regard to gonorrhoea is that of Clodi and Schopper⁹, who found gonococci in the cleft between the prepuce and clitoris in 26 out of 35 cases, and in 3 cases it was there alone, smears from the cervix and vagina being negative. The importance of this site as a source of reinfection and the need of treatment are obvious.

These newer methods may be used in combination with the well-tried drug treatment, for they appear to promise quicker and surer cures.

Chronic endocervicitis is a disease difficult to cure, because the infection is in racemose glands lying in a firm stroma, and having small ducts which do not permit the entrance of antisepsics. Therefore, local treatment is frequently unsatisfactory.

Pust¹⁰ recommends the application of celluloid capsules which cover the cervix, forming a closed cavity to retain the drug, which is applied first. He says that, analogous to the pus tube which quickly becomes sterile, bactericidal powers develop more powerfully in a closed than open cavity. The capsule is removed every 3 days, cleaned and reapplied. All gonorrhoea became bacteria free in 14 days. Endocervicitis clears up and erosions heal. He leaves them on during menstruation.

Young⁸ used a glass tube fitted over the cervix and connected with a suction apparatus to remove secretion from the glands, puncturing cysts beforehand, and to cause hyperaemia. He reports good results.

Dickinson¹¹ cauterizes erosions and cysts with a fine cautery, puncturing small granulating areas and drawing lines in larger ones. The

treatment is repeated 2 to 4 times, and causes an inrolling with shrinkage of the eroded area. This is a useful method for moderately everted and eroded cervices. It is an office treatment.

Burns¹² recommends ionization by means of electricity. The results show a decreased discharge from endocervicitis, but not much effect on erosions.

If local treatment is not effective, operative treatment is necessary, and consists essentially of 3 methods,—trachelorrhaphy, amputation by Emmet's or Hegar's method, and excision of the infected area by Sturmdorf's method. Rawls¹³ reports the results 1 to 5 years after operation of 132 amputations and 79 trachelorrhaphies. He concludes that they are both effectual operations, that the general health is improved in 82 per cent., but the improvement is greater after amputation; amputation is more effective in curing leukorrhoea; and amputation is more likely to cause sterility and abortion than trachelorrhaphy.

Friedlander¹⁴ reports the results of 42 Sturmdorf operations, all of which were cured. He holds that it is safer and more quickly performed than amputation, and is to be preferred because it does not destroy the muscular structure of the cervix.

Pruritus vulvae is another troublesome disease for which everything has been tried. In the last few years radium, x-ray, and ultraviolet light have been used with varying success as regards permanent relief. Stacey¹⁵, reporting from the Mayo Clinic, finds that x-ray is more satisfactory than radium, except in cases of kraurosis, where radium gives relief of symptoms with no apparent effect on the kraurosis.

Pitcher¹⁶ has treated 23 cases of pruritus with ultraviolet light, and reports permanent relief after 6 to 12 treatments. These methods should be tried in stubborn cases.

Stacy¹⁷ reviews displacements as follows:

"One thousand consecutive cases of unmarried women, 15-45 years of age, with no record of pelvic infection, pelvic tumor or pregnancy, were studied to determine the relative frequency with which the various displacements of the uterus and the attendant symptoms occur in cases in which no pathologic or physiologic factors could have affected the position of the uterus. Retroposition was found in 202; this indicates that the ratio of 1:5 is constant in the congenital type. In the true congenital cases of retroversion the fetal type persists, the axis of the organ is perpendicular, and the intestine fills the uterovesical space. It is reasonable to assume that the second and third degrees of retroposition are the result of continued intra-abdominal pressure during childhood and early adult life. Congenital retroposition *per se* does not give rise to symptoms, but symptoms in the acquired type are more common in cases of retroposition than in cases of anteposition."

"In this series, anteposition occurred in 798 cases. The age at which menstruation becomes established is practically the same in women with anteposition and in those with retroposition. Dysmenorrhoea occurred in 102 of the patients in whom the uterus was in anteposition, and in 33 with retroposition. Patients with retroposition had intermenstrual backache slightly more often than those with anteposition.

"Operation for pelvic complaints was advised for only 6 of the patients with anteposition, and for 3 with retroposition. Congenital retroversion, associated with backache, dysmenorrhoea, etc., is usually part of a general picture of deficiency of development. Surgical procedure to relieve pelvic symptoms in uncomplicated cases should be advised only after careful study of the patient from the point of view of the general, as well as the gynecologic condition."

Findley¹⁸ reports 480 cases of retroversion and retroflexion, only 20 of which were uncomplicated, and 70 cases of prolapse. He believes that uncomplicated retroversion has no significance except possibly in sterility. Indications for treatment rest on associated pelvic lesions, and not on the displacement itself.

Schwarzenback¹⁹ agrees with the previous writers.

The treatment of prolapse has few new elements. Each surgeon works out his own method and uses it. If the child-bearing function is to be preserved, most men do plastic operations on the vagina, and some form of suspension of the uterus through the abdomen. If this function is not to be preserved, there are two general methods of operation, one which combines the plastic operation with an abdominal suspension, the other a vaginal operation alone achieving the same result. The first method varies with the disposition of the uterus from leaving it in to removing it, usually near the internal os, and suspending the vagina by the broad ligaments or abdominal wall. In any case the cul-de-sac of Douglas should be obliterated if it is deep and accompanied by a rectocele.

The second method also varies with the disposition of the uterus, which may be left in and interposed between the bladder and vagina if there is much cystocele, or removed with suture of the broad ligaments to the vagina. Either method must be accompanied by careful plastic operations on the vagina.

Ward²⁰ reports a method of treating the deep cul-de-sac of Douglas found with large rectocele by separating the rectum from the vagina, sliding it up so as to attach the lowest part possible to the top of the vagina. This leaves a pouch of subperitoneal tissue and peritoneum, which is cut away, thus reducing the depth of the cul-de-sac. A careful perineoplasty follows.

The method of treating fibro-myomata of the uterus has received a good deal of attention recently because the use of radium and x-ray

has curtailed the field for operation to some extent. Most reports are favorable to irradiation in suitable cases. Deaver²¹ is the most prominent opponent to its use, his grounds being that the mortality with operation is so small that he does not advise radium unless operation is definitely contraindicated; he feels that the artificial menopause caused by radium in young women is serious, and not inviting in older women; one cannot be sure that there is no infection in the adnexa; and fistulae, and necrosis are sequels which have followed radium but not operation.

It is fair to say that fistulae, necrosis and the stirring up of unrecognized inflammation are very uncommon with radium used by capable men.

The indications for the use of radium as worked out by many men, among whom Clark,²² Miller,²³ Heaney,²⁴ Gellhorn,²⁵ and Crossen,²⁶ have written recently, are: uncomplicated tumors not larger than a four months' pregnancy in women nearing, during, and after the menopause; constitutional diseases prohibiting operation, such as tuberculosis, diabetes, cardiac, nephritis, etc., and a grade of secondary anemia making operation dangerous.

The size agreed on is an arbitrary one, but tumors larger than that are more likely to have cystic or calcareous degenerations which are contraindications to radium, as radium might increase the necrosis. It is generally believed now that radium affects the ovaries, especially by destroying the Graafian follicles; causes an obliterating endarteritis in the fibroid; and causes necrosis of the endometrium, with perhaps a resulting increased amount of connective tissue in it. Therefore any necrotic process, any pedunculated fibroid, and any infection in the tumor are contraindications to its use.

The age of fertility is a contraindication, for two reasons. To obtain a recession in the size of fibroids with radium, it is necessary to cause a long, and probably permanent, amenorrhoea which results in sterility and artificial menopause. Therefore, if possible, myomectomy is the treatment advocated by most writers for patients in that age limit. If hysterectomy is the only possible operation, then radium may be used instead of operation. The other reason is that some authorities, notably Mayo,²⁷ Clark²², and Heaney²⁴ feel that the menstrual function should be preserved, and that if enough endometrium and an ovary can be left to preserve it, operation is better than radium.

Any inflammatory process in the genital tract, especially in the tubes, may be made worse by radium, and lead to serious consequences, death in a few reported cases (Deaver).

Neoplasms, especially of the ovary, and cancer of the uterus, complicating fibroids call for surgical treatment if operable. Sarcomatous change in a fibroid is usually not diagnosed until after surgical removal, so it is probable

that some of the great numbers of fibroids treated by radium have been sarcomatous, and apparently cured by radium (Clark). However, it is advocated that rapidly growing and soft fibroids should be operated on rather than radiated.

The larger submucous fibroids, and those uteri with a distorted uterine canal preventing the proper placing of the radium, are contraindications. With an associated abdominal lesion requiring surgery, radium had better not be used for the fibroid, because usually both conditions can be treated surgically at the same time.

It is evident that an ether examination is necessary in many cases to rule out contraindications, especially cancer of the endometrium, and that the determination of the type of treatment is then made. Therefore, radium should be used by the surgeon, or under his supervision. Radium is especially valuable in treating fibroids in patients with a constitutional disease, such as diabetes, where operation is more dangerous than in the average case, because they may be examined under gas and oxygen to rule out cancer, the complications to be feared at the age constitutional diseases usually appear, and the radium inserted.

X-ray has an effect similar to radium, but requires several applications, whereas one treatment with radium is usually sufficient. It has the same contraindications. It has the advantage of not requiring an anesthetic, but, as we have said, many cases should be examined under anesthesia to make an accurate diagnosis, and radium can be applied at the same time. Therefore, radium is used more by gynecologists than x-ray. Hanks,²⁸ citing 100 cases treated by x-ray, says that the onset of the menopause is more gradual than with radium, as two or three months elapse before it is established, and she thinks it resembles the natural change of life. Also that larger tumors can be treated with x-ray than radium. Beclere,²⁹ who has had a large experience with x-ray, says that in young subjects it is sometimes possible to destroy the myoma without causing sterility. Most authorities believe that it is necessary to cause amenorrhoea to get the required result. Of his last 294 cases, 172 reached to 10 centimeters above the pubes, and 8 were giant myomas. Of these 294 only 10 relapsed. He believes that the treatment should be directed against the fibroid itself, and that the ovaries should be affected by the rays only to an amount that prevents their stimulating action on the growth of the myoma.

As to the actual results with either method, the bleeding is stopped and the tumor regresses or becomes unpalpable. If the bleeding continues, cancer, a pedunculated submucous fibroid or polyp should be suspected. If the uterus contains a number of small fibroids, they may regress so that the uterus reaches normal size.

If there be one or several large ones, they grow smaller, but remain palpable. This diminution in size extends over a period of several months, perhaps a year or more, and is of longer duration with x-ray than radium.

Closely allied with this subject is that of adenomyoma. They should be treated surgically when possible, but those in the rectovaginal septum may be treated with radium placed in the vagina and rectum, or with needles inserted into the growth (Stacy¹⁵).

During the child-bearing age, myomectomy is the treatment of choice, as it conserves the reproductive function, and the menstrual function, according to Mayo.²⁷ Five hundred and four patients traced after myomectomy had 43 living children, and 15 were pregnant; 23 that were sterile before operation had children after. Only 2.56 per cent. required secondary operation, and more than half of these were performed for inflammatory disease. Goullioud³⁰ reports 11 pregnancies among 40 myomectomized women. Bonney³¹ favors myomectomy, reporting 100 cases. The largest number of tumors removed from 1 patient was 30. He knows of no recurrences, and 3 operated on several years later had normal appearing uteri. Didier and Hidden³² report a case in which 9 fibroids were removed, the uterine cavity being opened 4 times to get them out. The patient became pregnant 10 months later, and had a forceps delivery, probably low, after 15 hours of labor.

From looking over the literature, it is apparent that myomectomy is being done more often, and on more difficult cases than formerly. It has been regarded as more dangerous, more likely to be followed by adhesions than hysterectomy, and there is a chance of recurrence. Mayo's²⁷ myomectomy mortality was less than 1 per cent., Bonney's,³¹ 2 per cent.; Goullioud's,³⁰ 2 per cent., and Tuffier's,³³ none in 72 cases. As regards recurrence, Mayo²⁷ has less than 2.56 per cent., and Bonney³¹, none. If a recurrence does take place, it is now possible to treat with radium or x-ray, so the bugbear of a second operation is much lessened.

There are few reports of myomectomy during pregnancy. Goullioud³⁰ prefers to wait until the end of pregnancy. Bonney³¹ says that a pedunculated or superficial tumor may be removed without much danger of miscarriage, but that multiple myomectomy usually causes it. The question of operation rests on many factors, such as number of tumors, position, size, stage of pregnancy, etc., which vary so much that no rules can be formed; each case must be considered of itself.

It is generally considered that at and after the menopause hysterectomy is the best treatment for cases requiring operation. The question of whether to do a supravaginal or complete hysterectomy depends mostly on the individual surgeon's experience and the state of the

cervix. The former is the less dangerous operation, but if the cervix is badly lacerated or eroded, it is often removed also, as a preventive of cancer. Isolated cases of cancer in the cervix left behind are reported from time to time, but we believe that the consensus of opinion is that it does not happen any more often than in the usual parous woman. The question of whether to remove or leave the ovaries is still under discussion, and will be dealt with later in this paper.

Thompson³⁴ speaks of the relation of heart disease and fibromyomata. He thinks it possible that since "as a sex gland the thyroid is influenced by menstruation and pregnancy, the hyperplasia and cell proliferation of the uterus found in fibromyomas may activate the thyroid. The myocardial weakness noted may be due to hyperthyroidism, and not directly to the fibromyoma." He feels that it is important to study the patient for evidence of hyperthyroidism. Polak, Mittell, and McGrath³⁵ have studied the relation of hypertension to fibroid disease in 416 patients, and found that hypertension was associated with fibroids in women averaging 46 years of age without renal or cardiovascular disease. The highest systolic reading in 82 of such cases was 185, and the average was apparently less than 160. Bleeding seemed to have no direct effect on blood pressure. If it was checked suddenly by operation or radium, the blood pressure rose temporarily, and then regained the preoperative.

The relation of heart disease and fibromyomas has not been worked out definitely. It would seem possible that the incidence is not greater than in women without fibroids.

The radium and x-ray treatment of menorrhagia and metrorrhagia not due to demonstrable pathologic causes, such as fibroid, polyp, cancer, etc., has continued to be satisfactory. It is generally considered that the cause is of an endocrine character, principally hyperactivity on the part of the ovary. There have been several articles of which those of Clark and Keene,²² Miller,²³ and Neely³⁶ may be cited. The dosage has been established, so that it is uncommon to cause a more than temporary amenorrhoea at the worst in young women. The same contraindications hold that we have spoken of under the treatment of fibroids, except that the fear of causing sterility is small, because it is not necessary to cause a permanent amenorrhoea to relieve the condition. Menstruation continues, but in a more normal amount. There are enough reports of pregnancy in women previously treated with radium to relieve anxiety on this score, although a report of a large series of cases with that particular point in view has not been seen. The contraindications of pelvic inflammation and new growths should again be emphasized. An examination under an anesthetic is very important, especially in young women, to rule out

an endometrial polyp or small fibroid, and in older women, to rule out cancer.

Mattmueller³⁷ has grouped 620 cases of cancer of the female genitalia from a statistical point of view. Carcinoma of the cervix was most common between the ages of 46 and 50; of the body between 51 and 55; of the vagina between 56 and 60; and of the vulva between 61 and 70. The average fertility for 2600 healthy women was 3.4, while for cases of cervical "cancer" it was 4.4, showing the effect of child-bearing in causing cancer. Cancer of the body shows a fertility of 3.3. Nine and seven-tenths per cent. of cases of carcinoma of the cervix have never borne children (Hammond³⁸ says 3 to 4 per cent.). For cancer of the body the percentage is 30. Fifty-six per cent. of the cases in the cervix were operable, 84 per cent. of the body, and 70 per cent. of the vulva and vagina. Cases of cancer of the uterus, i.e., both body and cervix, operated on live an average of 8 months longer than the non-operated, but cases of cancer of the cervix operated average 1.5 months less than non-operated, due to the primary mortality. Ruling out the primary mortality, the operated cases live an average of 1 month longer than the non-operated. This last seems a rather astonishing observation.

As regards cancer of the cervix, there is no doubt that inoperable cases should receive radium or x-ray, or a combination to alleviate symptoms. The discharge is abated, and in some cases pain is relieved. The principal danger is of causing a vesico or rectovaginal fistula, making the patient more miserable than before.

The question of operation or radium for the operable and borderline cases is still undecided. Davis³⁹ favors operation. Of 35 cases operated on there was a mortality of 8.5 per cent., and a 5-year freedom from recurrence in 40 per cent. His operability percentage was about 33. Bonney⁴⁰ cites 100 cases operated on with a mortality of 20 per cent., mostly coming in the earlier cases, with a 5-year freedom from recurrence of 40 per cent. Both of these operators used the abdominal operation, except for 1 vaginal one by Davis.

Giesecke⁴¹ cites 243 cases of cancer of the cervix operated on, and 35 per cent. were apparently well at the end of 5 years. His operability was 70 per cent., and he used both the vaginal and abdominal routes, with a mortality of 18 per cent. A very interesting observation of his is that 47 of these cases had metastases in glands by microscopic examination, and 10 of these are among the 5-year "cures." All cases had x-ray following operation.

Statistics in regard to radium treatment are now beginning to come in. Zweifel⁴² reports 500 cases of carcinoma of the cervix treated between 1913 and 1916, with 13.8 per cent. 5 years free of recurrence. Schmitz⁴³ reports 109 cases with 11.1 per cent. free for 5 years. It must be remembered that these are percentages

for all cases treated, both operable and inoperable.

Zweifel's cases are grouped as follows:

Group 1. Operable, 77; well at the end of 5 years, 48 per cent.

Group 2. Borderline, 90; well at the end of 5 years, 20 per cent.

Group 3. Inoperable, 214; well at the end of 5 years, 6 per cent.

Group 4. Hopeless, 119; well at the end of 5 years, none.

Many of these did not follow the treatment to the end, because of the war, and prejudice against the treatment. Those that did may be grouped as follows:

Group 1—43 well at the end of 5 years, 81 per cent.

Group 2—50 well at the end of 5 years, 36 per cent.

Group 3—121 well at the end of 5 years, 10 per cent.

Taking Groups 1 and 2 of this second table together, 57 per cent. were well at the end of 5 years, which is somewhat better than the results by operation. Schmitz⁴⁵ shows 42.8 per cent. of his operable and borderline cases well at the end of 5 years.

The writer believes that these are the first series of radium cases which show as good a percentage of cure as operative statistics for similar kinds of cases.

It will be noted that in comparing radium and operation nothing has been said about morbidity. In the final decision as to the best method, the mortality, comparative comfort of the patient, duration of life, and occurrence of such complications as fistulae, chronic sepsis, hernias, and general disability following treatment, must be taken into consideration. There are not enough reports as yet to give any useful decision. It is fair to say that the radical operation is followed by greater morbidity than radium in the hands of those not expert in performing it.

Also the decision as to the best method of treatment is of such vital importance to the patient that radium should be used only in conjunction with advice from the surgeon or by the surgeon experienced in using it.

The combination of radium with operation is still in a state of flux. The objections to applying radium before operation are that it lowers the resistance of the tissues so that operation soon after may result in dangerous sepsis; if operation is delayed for several weeks it is found to be harder on account of the formation of connective tissue, but Leclerc⁴⁴ says that this is true only in those cases with invasion of the parametrium by cancer; and that operation following radium increases the malignancy of the disease, besides liberating malignant cells incarcерated by connective tissue formed by the radium treatment. The idea in using radium before operation is that it reduces the vitality of

the cells, and thereby lessens the chances of dissemination, and also makes apparently inoperable cases operable. The use of radium after operation, to kill cells left behind, is also open to doubt. It is obvious that it will need a great deal of experience and a long time to decide these questions.

The treatment of cancer of the fundus of the uterus originating in the endometrium continues to be operative, because the use of radium would be rather blind, as the tumor cannot be seen; necrosis of the uterine wall in the tumor area might cause perforation and peritonitis; and metastases to the ovary are common enough to warrant removing them. Giesecke⁴⁶ reports 47.6 per cent. of 5-year cures in 21 cases. Two of the 21 had metastases in the ovary. Meigs⁴⁶ reports 44 cases, and lays stress on the fact that before the menopause discharge becomes a noticeable symptom after hemorrhage, while after the menopause discharge comes first, and that more importance should be attached to irregular bleeding than is generally done. Sixty-two and five-tenths per cent. of the cases reported have a 5-year freedom from recurrence. Five of the 44 had metastatic growths in the adnexa. The best operation is a complete hysterectomy with removal of the tubes and ovaries. The Wertheim operation is not necessary, because gland metastases are late, and occur in those in the lumbar region.

We feel that the percentage of cures shown by these two sets of figures is rather lower than what has been believed to be true in cancer of the endometrium, and that more reports should be made in regard to the subject.

The outstanding advance in gynaecology in recent years is the work of Sampson⁴⁷ on hematomas of the ovary of endometrial type. These are tumors of the ovary characterized by a cavity filled with blood, and lined wholly or partially by tissue resembling endometrium, in that it consists of glands lying in a connective tissue stroma, frequently with old blood and blood pigment in the stroma. The tumors usually show a perforation, at which point they are adherent to neighboring organs, and often are accompanied by general pelvic adhesions. Adenomas of a similar type may be found on any of the organs in or bordering on the pelvis, especially the parietal peritoneum, cul-de-sac of Douglas, posterior wall of the uterus, sigmoid and appendix, *i.e.*, those organs which are frequently in close contact with the ends of the tubes.

It is supposed that epithelium from the tubes or endometrium becomes implanted in any of these situations, and gives rise to the growths found. In the ovary they invade the tissue, and as a result of their reaction to menstruation form cavities filled with blood. This continues with successive menstruations until the tumor finally perforates and spreads epithelial tissue in the blood over the pelvis, where it may become

implanted. The tumors may die and disappear, if all the lining mucosa is cast off.

Similarly primary implantations may occur on the peritoneal surfaces, but are usually small, though they may spread and become invasive.

The implantations occurring near the perforation in the ovarian tumors often resemble uterine endometrium more closely than the lining of the original tumor, and are more invasive and more closely resemble uterine endometrium than the primary implants on the peritoneum. Therefore Sampson believes that the ovary acts as an incubator or intermediary host, which may impart greater virulence to the tissue.

He shows that histologically some of these implants resemble more closely the mucosa of the tube, some the endometrium, and others a mixture of the two or a transitional stage. Also that these implantations are found frequently in patients with retroflexion of the uterus, fibroids, and uterine polyps—conditions which would favor a retrograde menstruation through the tubes into the abdomen.

He believes that these implantations in the ovary are the source of many ovarian cysts and carcinomas.

These implantations are very important, because Sampson has found 37 cases with these lesions in 170 abdominal operations for pelvic disease, in women between thirty and fifty years of age.

They cause especially acquired dysmenorrhoea or menstrual pain, with pelvic pain, and symptoms of chronic pelvic inflammation.

The treatment is surgical, but as to how radical it should be remains to be worked out. Many unrecognized cases must have been treated conservatively in former years with satisfactory results.

In another paper (*Arch. Surg.*) Sampson⁴⁷ discusses the intestinal implantations especially, reporting 12 cases in which the rectum and sigmoid with the appendices epiploicae and mesentery were involved 8 times, the appendix 4 times, and the terminal portion of the ileum twice.

This is a very important subject, and the three papers cited should be read by every surgeon. Another paper appeared in the *BOSTON MEDICAL AND SURGICAL JOURNAL*, 186-445, April 6, 1922, which reviewed the whole subject.

Jacobson⁴⁸ did experimental work with rabbits by autotransplanting pieces of endometrium to the pelvic peritoneum, fat, and ovaries, and found that they grew as described by Sampson. Also that pregnancy seemed to be a stimulus to their growth.

Meigs⁴⁹ reported a series of cases which confirmed Sampson's findings.

The rôle of the ovary as an organ supplying an internal secretion has assumed much importance in recent years because of the development of organotherapy; the use of radium and x-ray to treat abnormal bleeding, as they affect the

secretory function of the ovary; and the question of conservation of ovaries at operation.

The whole subject at present does not rest on a firm basis, because the exact chemical substance produced by the ovary has not been isolated as it has in the case of the thyroid, suprarenal, and perhaps the pancreas. Fellner,⁵⁰ Wintz,⁵¹ and others have isolated so-called lipoids from the corpus luteum, interstitial cells, and Graafian follicles, but they vary in action, and there is no unanimity of opinion in regard to them. Consequently present opinions rest on clinical and surgical experimental evidence.

There is much evidence that the ovary controls the reproductive organs to a large extent throughout life to the menopause, and the general organism up to the age of full growth and maturity, but how much it has to do with the general organism after this is problematical. Then there is the relation of the ovaries to the other organs of internal secretion, especially the pituitary, thyroid and adrenals. Merely an outline of the evidence can be given in this paper.

It is generally acknowledged that the ovary controls menstruation, because castration either by operation or radiation produces amenorrhoea. The ovaries may be removed, transplanted to other parts of the body, and menstruation continue, so their influence must be blood-borne rather than a nerve effect, and therefore internal secretory in action (Johnstone⁵²). There is much discussion as to which part of the ovary produces the secretion which causes menstruation. The corpus luteum produces a secretion which prevents menstruation, as evidenced by the persistent corpus luteum of pregnancy; the fact that in the early months of pregnancy the removal of this corpus luteum seems to result in abortion; that cases of amenorrhoea have been reported in which the removal of a corpus luteum has resulted in menstruation in a few days (Frankl⁵³), and that menorrhagia is found in cases which showed no or only old corpora lutea (Geist⁵⁴).

Cases of menorrhagia quite often show an increased number of enlarged Graafian follicles, so it is possible that they elaborate the substance which causes menstruation (Geist⁵⁴). Schickel⁵⁵, from the examination of ovaries removed at operation, and correlation with the menstrual history, concludes that the corpus luteum does not control menstruation, and that the follicles do give rise to menstruation. It is said by most observers that the corpus luteum is regressing anatomically at the time menstruation begins, which would appear to show that it might allow menstruation to occur by stopping its hormone at that time. Frankl⁵³ thinks that the ovum controls the corpus luteum by an internal secretion, so that if the ovum dies the corpus luteum regresses, and menstruation occurs; if it becomes impregnated and embedded, the corpus luteum persists. McIlroy⁵⁶ believes that the ovum must be considered as an organ of internal secretion.

because of the changes in the organism, such as uterus, breasts, the vomiting of pregnancy, etc.

Castration and the cessation of activity of the ovaries at the menopause are accompanied by atrophy of the genitals, both external and internal, and of the breasts to some degree.

From the above facts, the influence of the ovary on the reproductive organs is evident.

The relation of the ovary to the general organism is not as evident. It is acknowledged that its internal secretion has a definite effect during childhood in developing feminine characteristics, both mental and physical, and that this continues up to the time full maturity is reached, the end of the second decade. After that its influence is not so definitely established, and this has led to the difference in opinion as to the preservation of ovaries at operation. So far the evidence rests on clinical observation. Practically all believe that the child-bearing and menstrual functions should be preserved if reasonably possible. The difference of opinion lies in whether it is necessary to preserve ovarian tissue if the uterus is removed.

Graves⁵⁷ believes that the ovaries should be carefully preserved up to the time full maturity is reached, but that after that, aside from their reproductive function, they are not as important for internal secretory properties as is generally believed. He suggests that the occasional severe emotional disturbances after oophorectomy are due to psychic and poor anatomical restoration of the operative field, rather than endocrine causes, and cites cases from a long and varied experience to prove his point. Therefore, during the third and fourth decades the ovaries should be regarded as reproductive organs, and the choice between conservation and extirpation made on this rather than on the endocrine basis. Clark and Norris,⁵⁸ from an analysis of 252 hysterectomies, conclude that the ovaries do have a useful internal secretory effect, and that they should be conserved as a rule, but that an important factor is the patient's temperament. It is more important to conserve ovaries in nervous, highly-strung women than in others. Smith⁵⁹ feels that the ovaries should be removed in women who have passed the menopause, and that, generally speaking, the younger the woman the greater the need of retaining the ovarian secretion. Polak⁶⁰ believes that if the ovarian secretion can be retained, the patient has a smoother change of life. If the ovaries are to be retained care must be taken to preserve their blood supply. Otherwise they are more likely to become cystic. Conservation of the tube and uterine branches of vessels helps to achieve this (Clark, Polak).

In order to avoid the dangers of leaving an ovary in the pelvis with or without the uterus, transplantation of ovarian tissue has been tried. Ovaries left in the pelvis, following operations for inflammatory disease or hysterectomy for other conditions, may become adherent, cystic,

or malignant and necessitate another operation. To avoid this, and to make the ovary more accessible in case of trouble, transplantation may be done. If the uterus is left in, and the tubes and ovaries removed in inflammatory disease, for instance, ovarian tissue can be transplanted, and in a few months, 4 to 7, menstruation may reappear. The idea is of course to conserve the menstrual function. There are few statistical reports. Martin⁶¹ cites 73 cases in which the ovary was transplanted with preservation of the uterus, and in which from 4 months to 12 years have followed the operation. Of them 76 per cent. menstruated regularly. Aragon⁶² reports 7 out of 11 similar cases which menstruated, but does not give the length of time. The technique has been worked out especially by Bell (Martin's article). The favorite sites for transplantation are in the rectus muscle and internal oblique muscle. If pregnancy is desired, the transplant should be placed in the cornu of the uterus. Petit⁶³ reports such a case in which the patient became pregnant 18 months after operation, and had a normal child. Graves and Storer have reported similar cases in which pregnancy took place, but ended in miscarriage. The whole subject has been excellently summarized by Martin⁶¹ with a complete bibliography, and it should be read in full by those interested, especially the second reference.

This leads naturally to the subject of ovarian organotherapy. This does not rest on a sound basis at present, because the actual secretion has not been isolated, there is no method of standardizing the preparations, and preparations from three sources are being used,—extracts of the whole ovary, of the ovary without the corpus luteum, called ovarian residue, and of the corpus luteum alone. They are used for treatment of symptoms of the artificial and natural menopause, abnormal bleeding, dysmenorrhoea and sterility, and the vomiting of pregnancy principally.

Few papers have been published in the last year on this subject; we have seen no large series of cases reported. The consensus of opinion is that they are often effective in treating the vasomotor symptoms of the artificial and natural menopause, especially the former. Graves⁵⁷ sums up the situation very well, as follows: "It (ovarian therapy) has an uncertain but nevertheless unequivocal effect on certain dysmenorrhoeas. The same may be said of its influence in cases of amenorrhoea, delayed menses, clotting, menstrual headaches, etc. We have in our experience an increasing number of cases which seem to prove that it may stimulate fertility. Even at its best, the action of ovarian extract is uncertain, and excepting in occasional brilliant instances, rather feeble. Outside of its specific relationship to the reproductive functions, the influence of ovarian substance on the rest of the bodily organism is slight."

The problem of sterility has received a new

stimulus by the work of Reynolds, and the spreading use of the Rubin test for determining the patency of the tubes.

Macomber⁶⁵ reports the etiology of sterility in 500 cases. He lays stress on the points that about 1 in 10 marriages may be classed as sterile; that the cause of sterility is on the male side in about 50 per cent., and that fertilization is a complex physiological process fairly easily thrown out of balance. There are an astonishing number of causes for female sterility which may be classified as follows:

Inflammatory group (closed tubes, tubercular tubes, endocervicitis, endometritis), 30 per cent.

Congestive group (displacements, *e.g.*, retroversion; new growths, *e.g.*, fibroids; lacerated cervix, *etc.*; and simple congestion), 23 per cent.

Developmental group—poor drainage (anteflexion, double uterus, infantile uterus), 24 per cent.

Ovarian group (simple ovarian, and ovarian associated with anteflexion or retroversion; age, diet, premature menopause), 23 per cent.

These cases are classified according to the main factor, but many of them had a combination of causes. He concludes that "in dealing with sterility we are concerned primarily with disturbances in function, and that mere treatment of pathologic lesions, however important that may be, will seldom by itself be successful in relieving the sterility." We feel that this paper should be read in full by general practitioners, as well as those especially concerned with sterility.

Some cases of sterility appear in couples in which the male appears not at fault, and the female genitalia are apparently normal. Jacobby⁶⁶ and Rotter⁶⁷ advocate treating them from the endocrine standpoint, making an attempt to find out which organ of internal secretion is at fault, and treating accordingly. The organs most often involved are the pituitary, thyroid, adrenals, and ovary. This work has been carried out on relatively few cases; it seems to be of use, and is a field for future development.

The Rubin test is useful, because it makes it possible to determine the patency of the Fallopian tubes without resorting to a laparotomy in a good many cases. It consists essentially in the introduction of carbon dioxide gas into the abdomen through the uterus and tubes by means of a cannula, which fits in the cervical canal, attached to a tank of the gas with a manometer to register the amount of pressure. Asepsis is important. It is contraindicated if any active inflammatory processes are present in the genital tract, and near the menstrual periods. The passage of the gas into the abdomen may be proved in three ways. First, if the manometer reading rises to 150 to 200 mm. of mercury, the tubes are probably closed. If the reading is less than 100, usually 40 to 80, one or both are open. Second, with a stethoscope the passage of the gas

from the tube into the abdominal cavity may be heard as a bubbling sound. Henderson and Amos⁶⁸ believe that by this method they can tell whether only one or both tubes are open by the location of the sound. Third, enough gas may be allowed to enter the abdomen to cause a characteristic pain up under the right shoulder-blade, or to show in an x-ray plate. Peterson⁶⁹ has used this x-ray method for diagnosing pelvic pathology, and finds it of value in diagnoses uncertain by palpation. If the gas cannot be introduced through the tubes, it is put in through the abdominal wall by means of a trocar and cannula. It must be remembered that a failure to get the gas in by the Rubin method may be due to faulty technique, so it should be tried more than once. Cron⁷⁰ has tried as many as 12 times on one case before being successful.

There are many enthusiastic reports of its reliability. Rongy and Rosenfeld⁷¹ report 42 per cent. of closed tubes in 100 cases of sterility, Cron⁷⁰ 50 per cent. of 34 cases. Novak⁷² reports 10 cases of nonpatency by the test controlled by operation following the test, in which 9 had closed tubes, and the other showed no apparent reason for the gas not going through. Besides its diagnostic use, it seems to have a therapeutic effect, for Rongy⁷³ reports 4 cases which did not menstruate after the test, and were found to be pregnant. He suggests that mucus was blown out of the tubes or kinks were straightened. Cron⁷⁰ suggests that this method may be used following salpingostomy and other operations on the tube to maintain the patency.

Reynolds and Macomber⁷⁴ published, in 1921, an interesting paper on Defective Diet as a Cause of Sterility. Loeb⁷⁵ reports experiments which generally confirm their findings. Guinea-pigs were undernourished, and in none did mature follicles develop in the ovaries. He also found that a complete excision of the corpora lutea in the guinea-pig ovaries led to an acceleration of ovulation. If this was done with the actual cautery, the heat damaged the rest of the ovarian tissue and no acceleration took place. Reynolds and Macomber⁷⁴ studied diet in relation to sterility in rats and humans, and their paper should be read in full, as a satisfactory abstract would be too long for this paper.

Werner⁷⁶ has reviewed the course and treatment of genital tuberculosis so well that an abstract of his paper is given:

"Operative treatment has been used by French surgeons, while conservative treatment has been advocated by the Germans (especially Amann, Martin, Veit, and Kroenig). The difficulty of making an accurate diagnosis without operation makes the statistics in regard to cure by medical methods uncertain. In making a diagnosis the past history of consumption, Pott's disease, etc., is important. Late appearance of menstruation with dysmenorrhoea is in favor of genital tuberculosis; abnormal menstruation

is of little value, because any kind of change may be found in this disease. The general health and appearance is unreliable. Fever with tumor is in favor of a positive diagnosis, but it may be entirely lacking. Pain varies greatly in degree and situation. Palpation is not reliable, though on the whole there is less spasm with tuberculosis than with other infections. The eye, skin, and tuberculin tests are not certain proofs, as there may be tuberculosis elsewhere in the body. The discovery of tubercle bacilli in the uterine discharge is difficult.

"In 1872 Wells did a laparotomy for supposed ovarian tumor, found tuberculosis, and the patient recovered. Konig employed this method for exudative peritoneal tuberculosis in 131 cases, with good results in 107, of which 38 had a recurrence in the first year, 17 in the second. Phillip collected statistics showing 65 per cent. of healing in operated cases, Borehgreving in 63 per cent. Veit says that from 60 per cent. to 70 per cent. of ascitic cases are cured by laparotomy. The adhesive form is much less amenable to this treatment, only 28 per cent. (Epsen-scheid) to 33 per cent. (Naunyn) being relieved.

"It is not so easy to decide from the literature what the results are in genital tuberculosis, as this is frequently found with the peritoneal type. Most authors are more concerned with the indications for operation. In general do not operate if the patient has fever, because the process is spreading. Thick adhesions contraindicate operation because of the danger of faecal fistulae (8 per cent. Konig.) Hegar, Veit, Sellheim advise removal of the uterus; others (Baisch) do not, relying on spontaneous cure. Veit leaves the ovaries, if not too infected. Vogt operates in one-sided infections, to conserve the child-bearing function, using x-ray for the bilateral. Wagner uses the vaginal route to avoid spreading the disease to the general abdominal cavity. Kleinann operates after the failure of conservative treatment.

"By conservative treatment, with the exception of x-ray, Kusmaz in 1889 reported 33 per cent. of cures; Borehgreving 81 per cent., the methods used being the same as for consumption.

"The author reports 14 cases of peritoneal and 23 of genital tuberculosis. The classification rests on the dominant type, both kinds being found in most cases. Most of them were treated with x-ray after operation. Of the former 14 cases, 11 were of the ascitic form and 3 of the adhesive; all had exploratory laparotomies. Of the 23 cases of genital tuberculosis 10 had abdominal hysterectomy with the removal of both adnexa. Three had partial removal of the adnexa by laparotomy, two by vagina; one of the latter had a large abscess opened resulting in a recto-vaginal fistula. Four had exploratory laparotomies but conditions were so bad that nothing was removed. One was explored by the vag-

inal route but such dense adhesions were found that nothing was done.

"Results.—Thirty-seven cases, two operative deaths, 5.4 per cent. There were three fistulae, 8 per cent. (two of them in one patient). The end-results were hard to verify because of difficulty in following the patients, but over 50 per cent. were cured.

"X-ray treatment is giving good results with weak dosage so that amenorrhoea and sterility do not have to occur.

"Summary.—Laparotomy should be done to verify the diagnosis, let out the fluid and remove diseased organs and then x-ray therapy should be used."

Peterson⁷⁷ reviews 100 cases operated on and in general agrees with the above. Of 44 cases in which tubes, ovaries, and uterus were removed the tubes were involved in 86 per cent. and the uterus in 50 per cent. His end-results show 75 per cent. in good health.

Peterson⁷⁷ and Schott⁷⁸ both believe that operation should not be done if there is a very active pulmonary infection.

Mention should be made of the treatment of acute pelvic infections with the injection of milk intramuscularly. This has been used in Germany for a few years for acute suppurative infections, especially of the eye, and is based on the idea of raising resistance by the injection of a foreign protein, that of milk in this case. The milk is boiled in a water bath for 3 to 10 minutes and 4 c.c. are injected intramuscularly every 3 to 5 days for several treatments with quite remarkable effects at times. Gellhorn⁷⁹ reports his experience in 13 cases of subacute and chronic pelvic inflammation, 10 of which had gonorrhoea. The average number of injections was 8. The treatment is followed in 6 to 8 hours by a reaction consisting of a rise in temperature, nausea and headache of varying degree. The later treatments do not show this reaction. The results seem to justify the treatment, 6 of the gonococcal cases being completely cured, 2 of whom had pyosalpinx which completely disappeared after 8 and 11 days. One large pelvic abscess, and one large pyometra following radium treatment showed disappearance of their tumors after 5 and 12 injections respectively. Bochenski⁸⁰ reports the use of milk or caseosan, a preparation of milk protein, in 36 cases of puerperal infections with the conclusion that it does exert a beneficial effect, which is more evident in the subacute and mild cases. This is a form of treatment which seems to have been neglected in this country and which should be tried out.

Schumann⁸¹ in discussing hydatidiform mole says that the maternal mortality is certainly 15 to 20 per cent. as a result of sepsis, hemorrhage, peritonitis, as a result of traumatic perforation of the thinned-out uterine wall and the development of chorioepithelioma. The incidence of the last complication is very uncertain

because benign moles are not commonly reported, whereas those developing chorioepithelioma almost always are. Findley found it reported in 31 per cent. of 500 cases of mole which he analyzed. Others consider it a rare disease, as Symmers, who found no case in 12,000 autopsies. Because of these dangers and the uncertainty of malignant developments Schumann⁸¹ advises a hysterotomy, after making a diagnosis of mole by curettage, with removal of the mole if it appears not to be invading the uterine wall and hysterectomy if it is invading. The latter is the more common in his experience. Novak,⁸² in an excellent paper, discusses the difficulty in making a diagnosis of chorioepithelioma which depends on the facts that the histologic elements found in hydatid mole and chorioepithelioma are the same as with normal pregnancy, and it is well known that the normal placenta tends to invade the uterine wall. He believes that a very distinct invasiveness must be shown histologically to make a definite diagnosis of chorioepithelioma. He feels that thorough evacuation of the uterus will cure mole in most cases but if then bleeding persists a hysterectomy should be done at once. Nagy⁸³ agrees with Novak⁸² as to the difficulty of diagnosis.

We believe that there is a field here for the use of radium as a preventive of chorioepithelioma because it is well known that radium is especially destructive to embryonic tissue, and it is now generally conceded that the Langhan's cells and syncytium are of placental rather than decidual origin. Therefore it would be reasonable to treat cases having a mole with radium, after emptying the uterus, to destroy any tissue or cells left behind. It seems probable that they could be destroyed with a dose of radium which would not cause sterility. Clark has reported a case of chorioepithelioma cured after radium treatment. Naujoks⁸⁴ reports the cure of a case with x-ray, the diagnosis being established clinically and histologically, although there were metastases in the lungs and vagina.

There are a number of reports of cases of chorioepithelioma which are not of special interest except one by Black⁸⁵ of a case which illustrates the well-known vagaries of the disease. This patient, 37 years of age, showed on curettage a chorioepithelioma, and on laparotomy involvement of the left tube, ovary, sigmoid, descending colon, and side of pelvis so that nothing was done. The mass got larger during the next four weeks and then regressed so that now, over two years later, she is apparently well.

There are some advocates of local anesthesia for gynecological operations. Farr⁸⁶ does operations of all kinds with infiltration, sacral, and parasaeral anesthesia, varying the form with the location of the operation and using combinations such as infiltration alone, infiltration with sacral, or all three. The requisites are a knowledge of anatomy; gentle, skillful technique with sharp cutting instruments, and patience. The

main obstacle to success is incomplete exposure. Inflammatory conditions, except pelvic abscess demanding vaginal drainage, can be done more advantageously with this method because there is less trauma and the viscera are much quieter than under inhalation anesthesia with its vigorous breathing, thereby lessening the dangers of dissemination of the infection. In some cases general anesthesia may have to be resorted to for a time. Frigyesi⁸⁷ has done 350 gynecological operations, among them 315 laparotomies with these forms of anesthesia. Thirteen and three-tenths per cent. had brief general anesthesia and 15.5 per cent. had general anesthesia continued to the end of the operation. Vaginal operations are easier to perform than laparotomies, the most favorable results being with parasaeral, under which the most extensive vaginal operations may be done.

The psychic side or intelligence on the part of the patient is important because Farr⁸⁶ says that charity cases are not good subjects for the use of local anesthesia. Also the preliminary use of morphine is an important factor.

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The New England Surgical Society

LEIOMYOMA OF STOMACH, WITH REPORT OF A CASE.

BY ERNEST L. HUNT, M.D., WORCESTER, MASS.

Neoplasms of the stomach of other than epithelial origin are not sufficiently numerous to constitute a considerable clinical problem. Inasmuch, however, as there is a variety of such growths having an ascending scale of malignancy from the benign fibromas and adenomas through the myomas, myxomymomas, myo- and spindle-cell sarcomas to the round cell and lympho-sarcomas, the field is one in which the well-informed surgeon may expect occasionally to win a success.

Probably there is no surgical field which, during the past two decades, has been more thoroughly studied than that of the stomach. Several thousand operations upon the stomach itself are done annually and in many thousands of cases the stomach is explored as an incident to other operations. Industrious observers everywhere are reporting their cases and it would seem that the relative incidence of the different types

of new growths must be fairly established. In 1919, in a paper before the Southern Surgical Association (later published in *Surgery, Gynecology and Obstetrics*), Professor Haggard of Nashville compiled the following figures upon the incidence of the various forms of sarcoma of the stomach. (Table I.)

Haggard was also able to find in the literature 230 authentic cases of primary sarcoma to which he added 13 cases from the Mayo Clinic and one of his own, bringing the total to 244, of which 107 were operated. Of the 107 cases there were microscopic diagnoses in 76, of which five were classified as myosarcoma, two as leiomyosarcomata, two as leiomyomata malignant.

As in so many developing branches of medical science, the oncological nomenclature is somewhat confused and the choice of terminology varies with different authorities. This seems particularly the case when the stomach tumors of myomatous origin are being discussed so that it becomes highly desirable that uniform terms should be used. Dr. Mallory, in a personal communication, says, "The term leiomyoma is applied to a slowly growing tumor made up of smooth muscle fibers. If it contains mitotic figures, that is evidence of fairly rapid growth, the tumor then is called a leiomyosarcoma. The presence or absence of mitotic figures distinguishes the slowly growing from the rapidly growing tumors."

We should keep well in mind the fact that many of the tumors in this class are benign for considerable periods, finally taking on rapid growth and passing into a malignant form. We, therefore, can hope for successful removal if the cases come to operation before this change takes place.

Outland and Clandenning, in 1913, report a case of leiomyoma of the anterior and posterior walls of the stomach near the pylorus occurring in a boy of nine years. Operation was by two stages with eventual recovery of the patient. They found records of 79 cases, of which 28 had had operations or were otherwise of clinical interest.

Limiting himself to stomach tumors of myomatous origin, Nassetti, in a series of articles from 1914 to 1918, covered the subject exhaustively, compiling a full bibliography, analyzing each report therein listed from the time of

TABLE I.

INCIDENCE OF SARCOMA (ALL FORMS) OF STOMACH: HAGGARD. 1919

840 Specimens of Sarcoma.	1 of Sarcoma of stomach.	(Berlin Pathological Institute.)
921 Cases of Gastric Ulcer.	4 "	(Smithies.)
3,500 Cases of Sarcomata.	4 "	(Tilger.)
13,387 Necropsies.	6 "	(Hosch.)
27,250 Abdominal Sections.	8 "	(Mayo Clinic; Masson)
2,067 Malignancies of Stomach.	13 "	(Mayo Clinic; Mayo.)
(or 1 sarcoma to 159 carcinomata.)		

Surgery, Gynaecology and Obstetrics, Vol. xxxi, No. 5, p. 505.

Morgagni (1762) to the date of publication. It is a splendid example of painstaking literary research. Nassetti includes all the cases compiled by Outland and Clendenning and finds that there are published reports of 140 myomatous tumors on record, of which number he contributed seven. These he classifies as shown in Table II.

TABLE II.

NASSETTI: MYOMATOUS TUMORS. (1919.)

140 myomatous tumors on record:

58 simple myomas.
37 fibromyomas.
6 adenomyomas.
1 myxomyoma.

102

9 "malignant myomata"
29 of mixed sarcomatous nature.

38

We may, therefore, fairly assert that non-epithelial tumors are rare and of them the relatively benign myomatous tumors constitute less than one-third.

Searching the literature since the above publication, I have been able to find but nine cases, of which the following are brief summaries:

CASE 1. (Reported by Ernest Neuber.) Patient, female 62 years old. Had a 10-day gastric crisis with pain, vomiting and fever in 1915. In 1917 had a second attack of convulsive pains under right costal arch. Later in epigastrium, not transmitted to back. Stools were tarry, no jaundice, not induced by taking food. Such attacks, lasting several days, occurred about every three months. Patient lost weight and a palpable mass was felt in the epigastrium. Sometimes the tumor would disappear with subsidence of the pains.

X-ray findings did not clearly reveal the condition except that the stomach was dilated and markedly distended. In the pars media was a spastic constriction dividing the stomach into two halves, with peristalsis weakened.

Operation.—Found stones in cystic duct. Tumor size of billiard ball inside post. Wall of stomach movable from pylorus to cardia. On opening stomach, a pedunculated tumor was found size of a billiard ball. Excised with pedicle and walls closed. Patient recovered in 18 days and remained well up to date of report (published Sept., 1920), *i.e.*, about three years.

CASE 2. (Reported by L. Von Frederich.) Woman, aged 32; no previous stomach trouble; had suffered with pain after eating for six weeks. An epigastric tumor could be felt. Stomach contents showed HCl. No blood in stools.

X-ray showed an incision on greater curvature, stomach slightly distended, no atony—peristalsis normal. Operation by Dr. Sultan, who found an external tumor on greater curvature 10 cm. above the pylorus. Recovery.

CASE 3. (Bourget, H., 1919.) Woman, about 69; had never been sick before; had intermittent discomfort in (para) umbilical region for five to six years and loss of appetite. No constipation, vomiting, fever or bloody stools. For several months had been aware of a movable tumor in abdomen. Examination showed, in an otherwise soft abdomen, a hard mobile mass at left of navel, easily pushed laterally and a little up and down. It appeared to be attached to the descending colon.

Operation.—Found a subserous tumor on anterior wall of stomach near the greater curvature, which was excised. Histologically, it was a tumor of smooth muscle fibers, a little inflamed on one side. Was well a year after the operation.

CASE 4. (Haggard, W. O., 1920.) Female, 17. Chief symptoms, hematemesis and bloody stools. Had two attacks one year before and second nearly fatal. Small tumor felt in epigastrium three weeks after the hemorrhage at apex of epigastrium, lasting about one month, then disappearing. Melena recurred three weeks and one week before admission. Pale and weak. X-ray showed an "extruding defect on lesser curvature." Hemoglobin, 40%. Reds, 2,150,000. Transfusion and partial gastrectomy, removing bluish, soft nodular, apparently cystic tumor with part of lesser curvature. Microscopic diagnosis by James Ewing. Complete recovery; well one year later. Leiomyosarcoma.

CASE 5. (Mayo Clinic, No. 204,520, quoted by Haggard.) Woman, 44; seven years epigastric pain and eructations of gas—no palpable tumor.

Operation.—Myosarcoma, posterior wall. Recovery.

CASE 6. (Mayo Clinic, No. 209,588, quoted by Haggard.) Woman, 40; tumor one year, for seven months attacks—pain, nausea and vomiting, no blood. Pyloric tumor found. Myosarcoma. Recovery.

CASE 7. (Eastman, J. K., and Bonn, H. K., Indianapolis.) "Leiomyoma is throughout benign; metastases are extremely rare." M., 58; no previous disease. No symptoms of common indigestion. For two weeks regurgitation of food immediately after eating. Sudden onset. No blood; spare, flabby; 110 pounds; 5 feet, 6 inches. Loss of 15 pounds in two weeks. Slight tenderness immediately below the sternum, with slight muscular rigidity here. Radiographically:

"Stricture of oesophagus 4-5 inches above cardia with ballooning above."

Diagnosis.—"Benign oesophageal stricture."

Operation.—Found tumor size of walnut in anterior wall of pylorus. No glands. Pylorectomy; Billroth No. 2, and Witzel gastrostomy.

Pathological Report.—Submucous leiomyoma.

CASE 8. (McArthur, L. L.) Female, adult (age not given.) Past history negative until present trouble began two years before entrance to St. Luke's Hospital, Chicago. Symptoms were headache, nausea and vomiting, often preceded by a chill; constipated with repeated attacks of jaundice, anorexia three months, two weeks epigastric pains after meals, lasting one-half to two hours, and melena three days. Profuse hematemesis just prior to admission. Exsanguinated. Hgb. 54 per cent. X-ray three months before admission showed stomach nearly normal in size. Peristalsis increased. Fifty per cent. residue after eight hours.

Diagnosis.—Ulcer.

Operation.—Found tumor size of English walnut, subserous, just above pylorus, springing from posterior wall, ulcerated at its tip.

Microscopical Diagnosis.—Fibromyoma.

Immediate Result.—Cured, no follow-up.

CASE 9. (R. Fritsche.) Male, 39 years. Two severe hemorrhages over period of three years; severe secondary anemia. No pain or palpable masses. Lenhardt treatment two first occasions. Three months after second hemorrhage admitted with diagnosis of perforated ulcer. Pallor, emaciation, cyanosis. Temperature, 38.3° C. Pulse, 130. Abdomen distended and spastic.

Operation.—Found stomach contents free in peritoneum and perforation through tumor.

Death nine days after operation. Autopsy.

Diagnosis.—Sarcomatous leiomyoma of stomach.

CASE 10. Personal case. A-21534. W. C. H. Admitted to Medical Service May 10, 1921. H. T. Male, white, 30 years.

Chief Complaint.—Heartburn for two months.

Born in Lawrence, Mass., he lived in Massachusetts all his life; left high school at age of 16 years. R. R. employee since, from freight clerk up to assistant yard manager. Used alcohol heavily up to 4 years ago. Married 11 years. No conceptions. Past history negative for diseases and injuries except measles and erysipelas in infancy. Treated by oculist for "Inflammation of eyes" since 1918 by glasses and drops.

Present Illness.—Began in September, 1920, with hematemesis and bloody dejections. Treated by milk, egg and carbohydrate diet with milk of magnesia up to February. Soups added to diet followed by heartburn, for which he then began to use "sodecia." Feb. 28, after trying mackerel, had acute indigestion; went to a phy-

sician who diagnosed duodenal ulcer, who again regulated diet and prescribed bismuth with improvement of symptoms but in about a week noted pallor; appetite poor since, sleeps well.

Physical Examination.—On admission, findings of note were marked pallor with slight lemon-yellow tinge. Pulse 98, temperature 97, chest negative.

Abdomen.—Soft, not distended, no spasms, masses or tenderness. Extremities: Reflexes and coördination normal, slight tremor of extended fingers. No edema, varicosities, scars or ulcers.

Progress.—Patient remained on Medical Service 10 weeks. During this time the stools were never free from occult blood more than a few days in spite of careful dietary restrictions. A gastrointestinal x-ray series taken May 12 reported: "Minute vacuole shown on duodenal border in series of plates. Cap otherwise irregular. No six-hour residue. Diagnosis: Duodenal ulcer." P. H. Cook.

Urine.—Normal throughout with specific gravity ranging from 1013 to 1020.

Blood.—On entrance, hemoglobin 30 per cent., whites 6200, reds 2,640,000 with marked anochromia, aniso and poikilocytosis. A single nucleated red was reported. Differential of whites showed nothing noteworthy. Platelets relatively increased. Wassermann negative.

After out-of-door treatment and two transfusions from Group IV donors the reds came up to 4,112,000 and hemoglobin to 70 per cent.

Stools.—Never any diagnostic findings except blood, which was evident both chemically and microscopically.

Stomach Contents.—Both fasting and after Ewald meal showed presence of free HCl but in reduced amounts, without other decided characteristics. Laetie acid was not noted.

As regards temperature, there was a daily oscillation between 97.5° and 99.5°, rarely exceeding either limit except that a rise to 102° followed each transfusion.

On July 19 he was transferred to Surgical under diagnosis of duodenal ulcer, severe secondary anemia.

Operation.—July 20, 1921. Ether. Right para median incision from level of ensiform to navel. Found rounded comparatively smooth mass size of a lemon above pylorus extending under liver. The first portion of duodenum was indurated and apparently part of the mass. Was able to separate mass from contiguous structures. Pylorectomy, followed by a posterior isoperistaltic gastrojejunostomy, was then carried out. Gall bladder noted as normal. Retroperitoneal glands about head of pancreas somewhat enlarged. Patient left table in moderate shock. Pulse, 124.

Convalescence was stormy for first 10 days, then progressed well. He was out of bed on the seventeenth day and was discharged on the 27th, free from digestive symptoms and on a fairly

liberal diet. Post-operative x-ray November 3, 1921, showed stoma working well; stomach emptying rapidly so that head of meal is at rectum in six hours.

After History.—Arrangements were made with Dr. F. D. McAllister of Lawrence for x-ray treatments. Patient reported June 30, 1922, at which time his hemoglobin was 73 per cent. Red count, 5,430,000. He was still 30 pounds under weight and lacking strength. Examination of abdomen found a rounded tumor in epigastrium which felt about size of a hen's egg and was not adherent to scar. This was evidently a recurrence. Operation was advised and rejected by patient.

GENERAL CHARACTERISTICS OF THE GROWTHS.

Although derived from muscle cells, their increase in size soon distorts their relations to the strata of the stomach wall and they push outward or inward to form subserous or submucous masses, the former occasionally attaining great size, while the latter may be modified by ulcerations and either may suffer hemorrhages or form cysts within their substance. They may spring from any portion of the stomach wall, as shown by Nassetti, who found in 106 observations as to the site, that 14 occurred in various situations on the anterior wall, 15 on the posterior wall, 30 were on the greater curvature, 12 on the lesser, 23 on or near the pylorus, 7 near the cardia and 5 on the fundus. In relation to the strata, 48 were submucous and internal exclusively and 3 partially, 50 were external and subserous exclusively and 10 partially. Of the submucous, 36 were sessile and 12 pedunculated, and of the subserous 14 were sessile and 41 pedunculated.

In my case a firm, ovoid mass with smooth surface projected from the upper surface of the pylorus and first portion of the duodenum upward, inward and backward into the gastro-colic omentum, from which it was readily freed by clamping off and cutting away the omental tissue and several fair-sized vessels. When removed, the entire growth had somewhat the shape of a uterus though a little larger. It projected into the lumen of the duodenum by a rounded nodule, the central portion of which was ulcerated away so as to resemble an os uteri. In consistency it resembles the uterine myomata and on section it is firm and crisp, showing bands and whorls of parallel and interlacing striae. Its external surface is smooth, save for remnants of the omental tissue, and is partly covered by peritoneum.

Microscopically it consists of bundles of spindle cells of rather uniform size, each having an elongated vesicular nucleus and acidophilic protoplasm without visible intracellular substance. The bundles spread in a

penniform manner and interlace so that a field will show fibers in longitudinal groups, and others cut obliquely or in cross sections. There are rare capillary blood vessels having only endothelial walls. Round cells and occasional polymorphs are scattered among the fibers and in certain nuclei which seem to lie between the muscle cells the chromatin stains deeply and is to a certain extent polarized, suggesting mitosis, but no regular mitotic figures are found in the muscle cells themselves. In general, the cells seem thicker and the nuclei larger than in normal gastrointestinal muscle. In the sections studied there is little evidence of fibrous stroma, the myomatous elements being close together. The gastro-duodenal mucosa covering intruded portion shows ulcerative necrosis but no hyperplasia.

(The gross specimen, most of the x-rays and slides are now in the possession of Dr. Joseph C. Bloodgood, who diagnosed it as leiomyoma from the sections in Worcester City Hospital laboratory. I regret that his final report is not yet at hand.)

DIAGNOSIS.

The clinical recognition of a tumor of this type is conceded to be practically impossible until operation discloses it. Outland and Clendenning remark that they are usually diagnosed as ulcers until operation, when they are usually considered sarcoma, and it is only by histological study that the true diagnosis is arrived at. In my case, history repeated itself in just that manner, and indeed I should have probably always considered it a spindle cell sarcoma had not Dr. Bloodgood set me right.

It seems, however, that with modern methods of diagnosis we ought to do rather better than has been the case in the past and I wish to particularize a little in this relation.

Age Incidence.—Apparently no age is immune, but the greatest number of cases occur between the ages of 40 and 70.

TABLE III.

Gastric Myomas.

Table of Age Incidence.

Age by Decade	Nassetti's collection.		Author's collection.		Total
	Male	Female	Male	Female	
0-10	2				2
10-20		2			3
20-30	1	1			2
30-40	1	8	2	2*	13
40-50	5	13		2	20
50-60	8	14	1		23
60-70	12	9		2	23
70-80	4	6			10
80-90	1	2			3
					99

*Exact age not given in one case.

Past History.—Herein is an important differential point from ulcer as Haggard pointed out. Symptoms usually come on without a prolonged previous history of pain after eating. Patients are usually definite as to onset of symptoms.

Symptoms.—I have made calculations from the symptoms shown in Naselli's tabulations and from the histories which I have gathered and have tried to express in percentages the prominent groups of symptoms. Be it understood that their accuracy is comparative only. The symptoms manifested can hardly be considered as of the tumors themselves, but as secondary manifestations caused by the presence of the growth in certain positions, to hemorrhagic, ulcerative, or inflammatory changes induced by the influences to which they are subjected. Therefore we may expect to encounter any of the symptoms with which we are familiar in other forms of stomach trouble. The possibilities I have endeavored to make clear in Table IV, which explains itself. I will simply call attention to the fact that 12 per cent. are silent throughout and are only revealed at autopsy or operations for other conditions.

The high percentage of hemorrhage of rather copious amount is a prominent feature of the records but apparently occurs with equal prominence in cases of sarcoma.

TABLE IV.

*Clinical Evidences of Myomatous Tumors of Stomach.*A. *Symptoms.*

SILENT—12%
Until there supervene symptoms due to

1. MECHANICAL CAUSE:

(a) OBSTRUCTIVE.
pyloric—pain in crises—dilatation—intussusception 5%
cardiac—dysphagia—regurgitation 2%
jaundice 1.3%

(b) IRRITATIVE.
dyspepsia—acid or gas eructations
nausea—constipation
sense of fullness or weight (all) 22%
discomfort—pain
cramps—pressure
vomiting
diarrhea 1%

2. ULCERATIVE CAUSE:

(a) pain in relation to taking food (all) 50%
(b) hemorrhage—
hematemesis
melena
occult blood
(c) anemia—secondary (all) 42%
(d) inflammatory reaction—
pain—fever—tenderness—spasm... 10%
(e) perforation 1.3%

3. TOXIC or COMBINED CAUSES:

(a) anorexia	2%
(b) loss of weight	18%
(c) anemia, grave and persistent	5%
(d) cachexia	2%
(e) HCl diminished or absent	7%

B. *Signs.*

1. PALPABLE MASSES.

45%

2. X-RAY.

(a) changes in contour
deformities—constrictions
(b) interference with peristalsis—atonyp
hypertonia
(c) obstruction—
cardio-oesophageal
pyloric—6 hr. residue
(d) intrusion defects—vacuole.

Signs.—The most important objective evidence is the presence of a palpable tumor, which the figures show occurs in 45 per cent. of the cases.



FIG. 1.—Hunt—Leiomyoma of Stomach. Photograph of the tumor, Case X, pylorus and duodenum split, showing intruding growth (A) and ulcerated area (B). Photo from Laboratory of Dr. J. C. Bloodgood.

Why none of us felt the tumor in my case has been a source of wonderment to me, and I can only explain it by the fact that it lay well up under the left lobe of the liver. In cases having masses on the anterior wall or greater curvature, rounded, hard and movable, the suggestion ought



FIG. 2.—Hunt—Leiomyoma of Stomach. Same as Fig. 1. Tumor bisected.

to be strongly in favor of sarcoma, myoma, or fibroma.

These cases with symptoms should not come to the autopsy table undiagnosed, for in the x-ray we have an agent which, in many instances at least, gives evidence of a "surgical lesion," whereupon exploration becomes a rational and proper diagnostic procedure.

You will note from the specimen that a rounded, liplike nodule pushes in from the upper and posterior wall of the duodenum and that it impinged against the anterior wall during the passage of the meal, causing the barium to pass around it is most probable. See Figs. 1, 2, 3, 4, 5.

Of course it could hardly be expected that a leiomyoma of the pyloric region would always

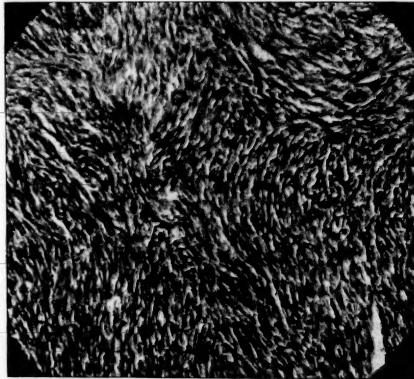


FIG. 3.—Hunt—Leiomyoma of Stomach. Photomicrograph of section from rim of growth. B. & L. obj. 16 mm. 0.25.

In the later cases we find the x-ray expressing certain findings: (1) an extruding defect on lesser curvature (Haggard); (2) an hour-glass constriction with dilatation; (3) interference with peristalsis and atony (Neuber); (4) an *anæsura* in greater curvature (Von Fredericks); (5) what was probably cardio-spasm (Eastman and Bonn); (6) and hyperperistalsis with 50 per cent. eight-hour residue (McArthur).

In the author's case the roentgenograms were unique in that a deformity of the cap was expressed by persistent irregularity, characterized by the absence of the barium from a small spot near the right border, described in the report as a "vacuole." Study of the specimen offers an adequate explanation of this curious picture.

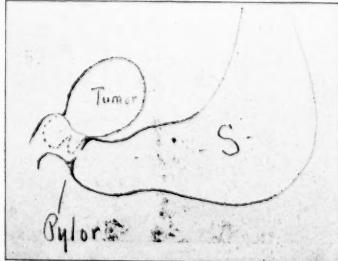


FIG. 4.—Hunt—Leiomyoma of Stomach. Sketch shows relation of tumor to stomach and relative size.

grow in a manner to reproduce this mechanical condition, or that another type of growth would not; nevertheless, the finding of such a vacuole should lead one to think of such a tumor and make the diagnosis of an intruding growth displacing the barium.

Finally, given a case with gastric symptoms of definite onset and no previous history of digestive symptoms, in an adult, especially if there are rather copious hemorrhages and a palpable, movable mass, with any of the x-ray findings mentioned, particularly the evidence of an intruding growth, one may be tempted to make a diagnosis; he at least should be stimulated to

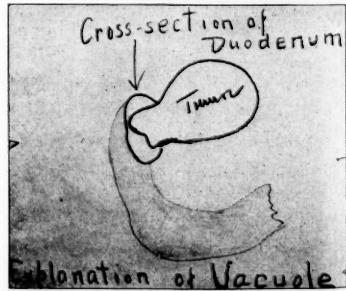


FIG. 5.—Hunt—Leiomyoma of Stomach. Sketch to show probable mechanism by which the vacuole shown in x-ray was produced. The vacuole corresponded to the point where the growth impinged against the anterior wall of duodenum.

complete his observations by an exploratory operation.

RESULTS OF OPERATION.

The follow-up records are very inadequate. Nassetti tabulated 38 operations from the literature:

Thirty-two subserous tumors—9 deaths, 19 cured, 2 not stated.

Eight submucous tumors—1 death, 7 cured.

My collection, 10 cases—All well one to three years, except in my own patient, in whom there is an apparent recurrence, and Fritzsche's, in whom perforation occurred and operation failed to save.

Conclusions.—Leiomyoma of the stomach, though rare and seldom capable of being diagnosed, should yet be identified clinically in a certain proportion of the cases. Early operation offers excellent prospect of cure. Late manifestations may be exceedingly serious, as shown in several cases of very severe hemorrhage, my own case with recurrence, and Fritzsche's case of perforation.

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DISCUSSION OF DR. HUNT'S PAPER.

DR. GILE, Hanover, N. H.: Dr. Hunt is to be congratulated on his valuable contribution to a rare and little known pathological condition of the stomach. But it is not easy for one to discuss a paper thus carefully prepared and on a pathological condition that is so unusual.

The obvious conclusion to be drawn, both from this paper and from such other small amount of literature as exists on the subject is, that myoma of the stomach will produce gastric disturbance that may simulate either ulcer or cancer, with the probability in favor of the latter; thus indicating surgical treatment as the most probable one for giving relief, or cure. And with this, as in many other cases where exact diagnosis cannot be made, when we have progressed far enough to place the case in the surgical rather than the medical field of treatment, we are at least in position to take the first step; namely, that of surgical procedure and if we can, with reasonable certainty, say that the condition is surgical we do not need to denominate it as merely an exploratory operation; for even if we cannot carry the operation to completion, it was obviously the only means through which relief could be expected.

Exact diagnosis here seems entirely out of the question, for neither x-ray, stomach contents examination, or other clinical investigation is capable of making the exact diagnosis. Consequently the diagnosis of a surgical condition of the stomach would appear to be the working diagnosis.

DR. DANIEL F. JONES, Boston: The non-obstructing characteristic of this type of tumor is shown by a recent case in which there was a leiomyoma of the jejunum in a man of 63 without any symptoms of obstruction. It was a large, rounded, movable tumor in the right upper quadrant which was mistaken for a tumor of the omentum. The portion of the growth about the intestine was solid while the more distant portion was cystic.

DR. ERNEST L. HUNT, Worcester: There was one interesting case in which the tumor was polypoid in the region of the pylorus, and the pain was spasmodic in character, occurring in crises. Finally the pedunculated tumor was drawn into the pylorus causing an intussusception.

DR. ROBERT B. OSCOO, Boston: Dr. E. A. Codman has just sent me a special delivery letter which I will read. "If you manage to say something about the importance of registering these rare bone tumors—" (reading letter).

The point is that Dr. Codman is doing one of those pieces of unselfish work of which he is quite capable, in registering cases of tumors. He is trying to make a clear outline of the nomenclature of these tumors; and Dr. Codman has sent me a proof sheet of an article on the registry of cases of sarcoma and a proof sheet which I will leave with the Secretary. I urge you to register with this registry all cases of bone tumors supposedly sarcoma.

DR. WILLIAM J. MIXTER, Boston: I have found that in operating on a considerable number of tumors of the spine that there was a tremendous difference of opinion as to the nomenclature to be used in describing those tumors. The specimens which have been sent to different laboratories have come back with thoroughly different answers, and the prognosis has been thereby markedly clouded. I feel that it is important to get the cases of bone tumor to the registry in order to try to clear up this question of prognosis and nomenclature if we possibly can.

OESOPHAGEAL DIVERTICULA.

BY FRANK H. LAHEY, M.D., BOSTON.

HISTORICAL.

In 1764, Mr. Ludlow, Surgeon at Bristol, England, sent to the Society of Physicians in London, which published Medical Observations and Inquiries, a report of "A Case of Obstructed Deglutition from a praeteratural Dilatation of, and Bag formed in, the Pharynx."¹ The case had come to autopsy and the oesophagus with its praeteratural bag and adjacent structures was prepared and preserved in the Hunterian Museum. The records of the last decades of the 18th century from Italy and Germany, furnish

six further references to similar lesions, and in 1816 Sir Charles Bell published in his volume of *Surgical Observations* a paper entitled, "A Praeternatural Bag, formed by the Membrane of the Pharynx."² In the frontispiece he presents a plate illustrating the praeternatural bag *in situ*, the cause of which derangement he defines in the text as a protrusion or hernia of the inner coat of the pharynx through the fasciculi of the constrictor pharyngis. These are the first references in medical literature to what is now termed the pharyngo-oesophageal diverticulum.

CLASSIFICATION.

Medical literature on this subject throughout the 19th century was relatively prolific, but until the work of F. A. Zenker and H. von Ziemssen in 1877,³ the various forms of oesophageal dilatations and diverticula were confused in the discussion of etiology and symptomatology of cases recorded. Zenker and von Ziemssen, however, made a careful study of the literature, which included twenty-three cases of previous observers and five of their own cases, which had come to autopsy and on the basis of this work they confirmed the classification of traction and pulsion diverticula, a classification which has now come into textbook use.

TRACTION DIVERTICULA.

Traction diverticula had been first correctly described by Rokitansky⁴ in 1840 as produced by traction from outside the oesophagus, usually from the cicatrix of a previously inflamed lymph node. Zenker and von Ziemssen added caries of the spine, pleurisy, chalcosis and mediastinitis to the etiological factors. The site of traction diverticula is always in the oesophagus itself, lower than the pharyngo-oesophageal junction, usually on the anterior wall, predominantly at the bifurcation of the trachea. They have a characteristic funnel shape. They may occur at any age, even in childhood. They are found casually at autopsy and rarely cause symptoms during life, presumably because the end of the sac is usually directed upward or horizontally forward rather than downward and because the muscle layer is involved and by its contraction keeps the pouch empty. Perforation with infection of bronchi, lungs, pleura and mediastinum is the one great danger from these conditions.

PULSION DIVERTICULA.

Pulsion diverticula, on the other hand, were shown to be an entirely different entity from the standpoints of pathogenesis, anatomical relations, symptomatology and pathological significance. It is with this form of diverticulum that we are concerned in this paper.

NEW CLASSIFICATION.

It may be noted in passing that in a recent

study of this subject by three French authors, Bensaude, Grégoire and Guéniaux,⁵ a new classification of oesophageal diverticula has been made on the basis of their location. The diverticula of the oesophagus itself have been distinguished from the pharyngo-oesophageal diverticula. The former include epiphrenic and epibronchial diverticula, found by x-ray to be located, the former just above the level of the diaphragm, produced either by pulsion or traction, and the latter at a point about half way down the course of the oesophagus, the true traction diverticulum first accurately described by Rokitansky.

PHARYNGO-OESOPHAGEAL DIVERTICULA: LOCATION.

The pharyngo-oesophageal diverticula are the pulsion diverticula of Zenker. They are located on the posterior or postero-lateral wall of the pharynx, just above its junction with the oesophagus and are always single. They project from between the fibres of the inferior constrictor, between the transverse and oblique bundles of the crico-pharyngeal division of that muscle. The pouch of the diverticulum occupies the praevertebral space behind and usually to the left of the oesophagus between the layers of praevertebral and praetracheal fascia.

SHAPE.

The shape of the pouch varies according to its relations with other structures, but is often described by the Germans as resembling that of the finger of a glove. It is frequently pear-shaped and occasionally the small diverticula are spherical. The opening of the sac is characteristically large in proportion to the size of the pouch.

INCIDENCE, AGE AND SEX.

The condition occurs predominantly in men, the ratio of men to women being about 4 to 1. It is a disease of middle or advanced age. Occasionally the prodromal symptoms begin in youth, but the fully developed condition occurs only after the age of 40 years.

ETIOLOGY.

The etiology of these diverticula was considered by the earliest observers to be entirely traumatic, Ludlow's case being ascribed to the swallowing of a cherry stone. But even as long ago as 1816, Sir Charles Bell described the condition as due to distention of the pharynx from ineffectual attempts to swallow, with a resultant protrusion of the inner coats of the pharynx through the hypertrophied bundles of the inferior constrictor pharyngis. The theory generally accepted today is practically identical with that proposed by Bell, namely, that the diverticulum is a herniation of the mucosa through the musculature of the pharynx, due to abnormal increase of intrapharyngeal tension plus some localized weakness in the posterior

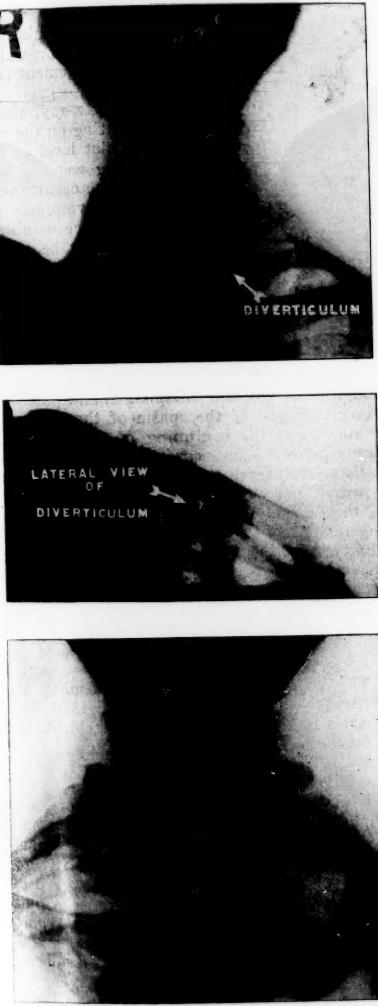
pharyngeal wall. The literature from the last decades of the 19th century to the present is filled with lively discussions as to the congenital nature of the localized weakness. Because it

congenital anomaly, causing symptoms only after food finds its way into it. This congenital anomaly was thought by one school to be due to a defect in the separation of oesophagus and larynx, by another to be produced by the failure to close, of a branchial groove, while a third school sought an atavistic basis for the condition. However, it is now generally agreed that evidence of the presence of muscular fibres is too scant to be conclusive and the trend of modern thought is toward the idea recently expressed by Kulenkampff⁶ that the condition is analogous to inguinal hernia and is produced by the establishment of a sac in the site of a congenital muscular hiatus, which is covered in with elastic tissue. When the elastic tissue relaxes with age, it no longer resists increased intrapharyngeal pressure and gradually the protrusion of mucosa occurs. The muscular hiatus or localized weakness in the posterior wall of the pharynx is situated, as has been stated, between the transverse and oblique fibres of the ericopharyngeus muscle, just above the opening of the oesophagus. The oesophageal opening is surrounded by the transverse fibres of the inferior constrictor, a band of muscle fibres possessing the power of contracting tonically. It is clear that when this muscle is spasmodically contracted and through some defect in the neuro-muscular mechanism fails to open in coordination with the propulsive action of the pharynx above, intrapharyngeal tension becomes so great that the weak spot in the pharyngeal wall gives way. Recurrence of such conditions produces a gradual dilatation of this spot in the form of a diverticulum.

SYMPTOMATOLOGY.

The symptoms of this condition have been divided by Starck⁷ into prodromal, direct and indirect. Prodromal symptoms, which may exist for years, are expectoration of mucus, (clear or purulent), dryness and a scratchy feeling in the throat, salivation, cough with hawking and choking sensation, slight discomfort on swallowing, cautious and deliberate deglutition because of a fear that food may stick in the throat. At times there is a feeling of a foreign body in the throat, producing choking sensations, and attempts at vomiting. With increase in size of the diverticula, these symptoms may progress to real dysphagia.

As soon as the pouch attains a certain size, the so-called direct symptoms occur. These include pressure in the throat during the swallowing of solid food, and the sticking of particles of food in the throat. At first large particles of food only are stopped, then smaller pieces—at first, only dry food is stopped, then semi-solids and finally in the extreme cases, the patient is unable to swallow fluids. The obstruction is due first to pressure of the sac filled with food on the oesophagus to which it lies parallel. A second factor in the production of pressure



FIGS. 1-3.—Preoperative radiographs of pharyngooesophageal diverticula.

had been stated by some observers that muscle fibres were present in the wall of the sac, and that, therefore, the diverticulum was a protrusion of the entire pharyngeal wall, the theory was evolved that the diverticulum exists as a



FIG. 4.—Postoperative radiograph. (Arrow pointing to scar at site of excision of diverticulum.)

symptoms is the closure of the oesophageal opening by traction of the filled sac, the round opening being thus converted into a slit-like orifice which does not permit the passage of food.

Regurgitation is always present, at first voluntary, to expectorate the food which is stopped, occurring usually during or after meals. On the other hand, undigested food of a previous meal may be regurgitated at a considerable period after that meal. Regurgitation is spontaneous and frequently is accomplished by finger pressure over the sac and by the assumption of certain postures. Spontaneous regurgitation is said to be best accomplished in the lateral decubitus position, right or left, rather than in the dorsal position.

Regurgitated material represents food from a former meal mixed with mucus and may or may not be putrefied. The foul breath which often accompanies this condition is dependent upon the presence of putrefaction of the contents. No HCl is found in the regurgitated material. The quantity of material regurgitated varies with the frequency of regurgitation and the size of the sac.

Gurgling noises in the throat, due to the mixture of air and food within the sac, are noted by many patients suffering from this condition.

The appearance of a tumor over the site of the sac is inconstant. When present it disappears after regurgitation and reappears as the sac is filled with food or fluids, ascending and descending also with deglutition.

As a result of pressure from a large sac distended with food or fluids, indirect symptoms such as dyspnoea, hoarseness or cyanosis from pressure on the vessels may occur.

The symptomatology is characterized by remissions but with shorter and shorter intervals. Sometimes it is the beginning of a meal which causes difficulty, sometimes it is the end, which sticks in the throat. Some patients swallow bet-

ter when standing, others when lying down. Occasionally a patient is able to wash out the diverticulum by making water pass into it.

X-RAY DIAGNOSIS.

Although as previously stated, all pulsion diverticula originate from the posterior wall of the pharynx, their course of enlargement is usually to the left.

They are all demonstrable by x-ray, the sac filling with bismuth and presenting on the plate as a pear-shaped shadow, the flat level of fluid bismuth in the sac usually being seen.

When, therefore, because of the occurrence of some of the above mentioned symptoms suspicion is aroused as to the presence or absence of this condition the question may be at once cleared up by means of an x-ray following the ingestion of a bismuth meal.

MEDICAL TREATMENT.

The medical treatment of this condition is confined largely to the passage of oesophageal bougies, to dilate the oesophagus and possibly to overcome some of the spasm of the pharyngeal sphincter at the beginning of the oesophagus. Many patients succeed in getting along quite satisfactorily with these measures. They should, however, not be continued, with increasing size of the diverticulum, with progressively increasing symptoms of obstruction or with diminished ability to ingest nourishment. Patients with these lesions should not be permitted to reach a stage of inanition where a preliminary gastrostomy is necessary.

SURGICAL TREATMENT.

The surgical treatment of oesophageal diverticula was first suggested in 1830 by Sir Charles Bell, who proposed the establishment of a fistula to empty the diverticulum of its contents. This was practiced in 1877 by Karl Nicoladoni⁸ in Vienna.

Kluge in 1850 conceived the idea of excision which was first done in 1884⁹ by Niehaus on a patient who had both a goiter and an oesophageal diverticulum. Niehaus first removed the goiter and when the symptoms were not relieved after 15 days, excised the diverticulum. The patient died on the 24th day of hemorrhage from the superior thyroid artery.

In 1892 Von Bergmann¹⁰ reported a successful case of extirpation and in the same year Theodor Kocher¹¹ performed the operation with healing by first intention.

A new method of procedure was proposed and practiced with good results by Girard¹² in 1896, namely the invagination of the diverticulum and the suturing of the oesophageal walls. In a case operated in this manner by Waggett,¹³ the pouch came out again after 8 months—upon violent sneezing of the patient, and on the second opera-

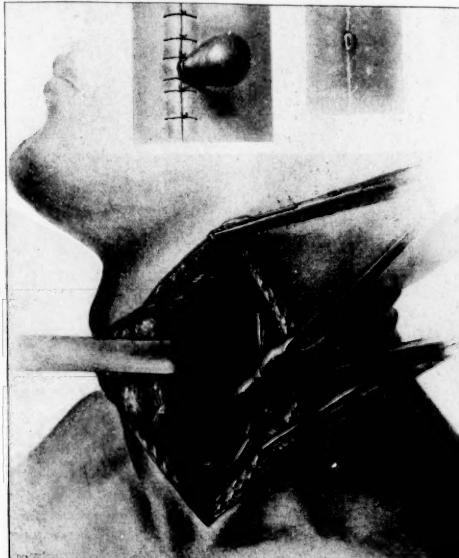


FIG. 5.—Drawing of operative dissection of sac in the case reported. Note relation of neck of sac to left lobe of thyroid gland. Upper insets show sac left in wound (1st stage) and mucous canal after excision of sac (2nd stage).

tion (excision) was found to occupy the same space as when first found. This procedure was elaborated by Bevan¹⁴ in 1917 who inverted the outer half of the sac and then buried the stump with a series of purse-string sutures.

Diverticulopexy was proposed by Schmid¹⁵ in 1912 who, in the dissecting room, fixed the bottom of the pouch at a higher level than its neck. This was practised in 1917 on the living subject with at least temporarily good results by Hill.¹⁶

Up to 1910-1915 the popularity of surgical treatment of oesophageal diverticulum was inhibited by the rather high mortality rate which followed one-stage operations on the diverticulum because of leakage from the suture line or the ligature at the neck of the diverticulum, the oesophagus being notably unreliable in its ability to heal tightly after suture. It is to be recalled that the course of the diverticulum as it enlarges is downward beside the oesophagus into the posterior mediastinum and that when it is extracted from this location, its neck sutured and sac cut away, the leakage from the suture line, which so frequently follows, will naturally be downward into the mediastinum along the tract from which the diverticulum was removed. In 1909, therefore, a two-stage operation was proposed and done by Edwin Goldmann¹⁷ in Freiburg, the pouch being freed, its pedicle ligated with silk, the wound packed and the sac fixed to the surface of the wound. This resulted

in sloughing of the diverticulum and on the 8th day a fistula was formed which healed in two months.

This two-stage method was improved by Murphy¹⁸ in that he implanted the sac in the wound with its neck unligated thus preventing sloughing and resected it two weeks after the first stage when the wound was granulating.

In 1918¹⁹ Judd reported a modification of this method whereby the edges of the skin were sutured to the neck of the sac, the wound closed and the sac left as in an unopened colostomy, lying upon the skin. Ten to twelve days later when healing had taken place within the wound and about the neck of the sac it was cut away without an anesthetic and its edges turned into the oesophagus.

By means of a slight modification of this method we operated upon the case to be reported. The modification consisted first of a partial twisting of the neck of the sac before implantation in the skin wound to prevent leakage after excision of the sac at the second operation. Furthermore, closure of the resulting mucus canal connecting with the oesophagus was accomplished by the repeated cauterization of the mucus lined fistula with crude carbolic acid introduced upon a cotton applicator. Care must be exercised to prevent twisting of the oesophagus itself into the neck of the sac, which results in the narrowing of the oesophageal canal.

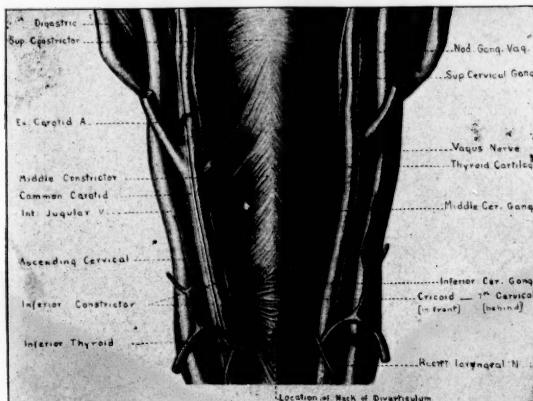


FIG. 6.—Drawing of dissection made under our direction, showing location of neck of diverticulum at junction of transverse and oblique fibers of cricopharyngeus muscle, the weak point in the pharynx, often called the pharyngeal dimple.

The use of this two-stage procedure, as has been so often the case in the recent progress of modern surgery, offers, it seems to us, a method by which a hitherto extremely hazardous surgical procedure may be made very much more safe, eliminating, as it does, when care is taken to prevent opening the sac during dissection, the danger of cellulitis of the neck and the almost universally fatal mediastinitis.

Case report, March 22, 1922.

Mr. Joseph C., referred by Dr. Wm. Chenery, Boston. Age 42. For several years has had slight difficulty with food sticking in throat. For past four months increasing difficulty in swallowing food. States that it sticks in his throat just back of his "Adam's apple" and that he has to raise it, when it comes back as a ball of food mixed with mucus. He also complains that he has to hawk in the morning, raising considerable mucus. He further states that for the past 8 months he has noticed a gurgling noise in his throat when he swallows.

X-ray taken after the ingestion of a bismuth meal shows the typical shadow of an oesophageal diverticulum located just to the left of the cricoid cartilage, the shadow showing the characteristic flat top of the fluid level. Operation: New England Deaconess Hospital, April 3, 1922. Dr. Lincoln Sise etherizing, Dr. H. M. Clute assisting. Longitudinal incision in front of the sterno-mastoid with retraction of that structure together with the internal jugular vein, common carotid artery. Division of the omohyoid muscle. The middle thyroid vein ligated and the left lobe of the thyroid gland elevated. Beneath this the diverticulum was found, carefully dissected from its bed, its neck freed, partly twisted and the wound closed, the skin edges being

sutured lightly to the neck of the diverticulum and the sac left free in the wound dressing. First intention healing occurred, the patient partaking of liquids without difficulty during his convalescence. April 14, 1922: Sac excised today painlessly with no anesthetic and remaining tract cauterized with carbolic acid. Patient discharged. April 17, 1922. No leakage of fluid or food on full diet. Cauterized with carbolic. April 20, 1922. Again cauterized with carbolic. Now able to swallow without any difficulty. States that it was often necessary for him, previous to operation, to press upon side of throat and empty sac before he could swallow again.

April 24, 1922. Cauterized. Eating well, no leakage. April 27, 1922. Swallowing well, cauterized, wound closing. April 29, 1922. Wound practically closed. May 10, 1922. Wound soundly healed, no difficulty in swallowing. X-ray report, 24 days after operation: No obstruction at the level of the lesion. There was a minute speck of barium which remained at the site of the operation for a moment, but the oesophagus was entirely clear at the end of a minute. This delay is probably due to the sear, produced by operation. Discharged.

CONCLUSIONS.

All patients presenting any of the prodromal symptoms described above should be x-rayed for the possibility of oesophageal diverticulum.

Medical treatment should not be continued with increasing size of diverticulum or increasing difficulty in swallowing.

Any of the various methods suggested for the closure of the oesophageal fistula may be used and, provided the mucosa be destroyed, the tract will heal.

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A CASE OF DIVERTICULUM OF THE ESOPHAGUS.

BY LUCIUS C. KINGMAN, M.D., PROVIDENCE, R. I.

Male of 58. Clerical occupation.

For several years previous to onset of symptoms of diverticulum, he had at times bronchial cough of explosive character. No other diseases. Gradual loss of weight for three years previous to operation—about thirty pounds.

Two years previous to operation began to regurgitate food. He found that this food was particles of whatever had been first swallowed in the course of a meal. This regurgitation gradually increased so as to keep him busy for a couple of hours after a meal. Pressure on the left side of neck facilitated the process.

Roentgenogram showed typical shadow of diverticulum of esophagus with very definite fluid level.



Operation, May 4, 1920. Ether insufflation anesthesia. Esophagoscopy by Dr. F. N. Bigelow. Through esophagoscope opening of diverticulum located posteriorly and to left with small ulceration on edge of opening. Bougies introduced into pouch and held there. Incision along anterior margin of sternomastoid. With

bougie in place two-inch sac was easily identified and dissected free. Then by withdrawing bougie from sac and running it down the esophagus the point of divergence of sac wall and normal esophageal wall could be accurately determined. The sac was then twisted without danger of twisting in the esophagus. End of sac sutured to skin and packed about with iodoform gauze.



Ten days later, without anesthetic wound was reopened, a tie placed about base of sac and wound closed about small drain. A small fistula persisted for ten days, healing spontaneously.

At present time no symptoms referable to esophagus. Has more than regained weight. Scar is not noticeable. X-ray shows on first swallow a slight line at former site of diverticulum that disappears so fast that it can only be seen by fluoroscope.

DISCUSSION OF PAPERS OF DRs. LAHEY AND KINGMAN.

DR. FRED B. LUND, Boston: Few of us have any idea of the power of muscular contraction of a tubular organ such as the esophagus. I have no doubt that if we could get our finger into a contracting esophagus, we would realize the force with which it contracts. Something about the muscular arrangement of the fibers associated with this strong contraction results in the fact that after repair, the esophagus is very apt to leak—possibly because it has not the adhesive peritoneum covering it that the intestine has.

The resection of the esophagus for cancer with end-to-end suture down through the pleura has practically never been successful on account of leakage. This led Torek of New York to devise his operation of division of the esophagus below the growth, turning in the lower end, then bringing the esophagus, growth, and all, into the neck and out through an incision in the neck. Then the cancer is cut off and the end of the esophagus brought out under the skin over the sternum. A tube from this opening over the sternum is carried down into the gastrostomy opening, and the patient is able to swallow. I have looked for years for an opportunity to do this, but in a large number of cases of cancer I found only two cases which in my judgment were strong enough to stand it. In the first one, an exploratory incision in the chest showed that the growth had extended

into the lungs and onto the aorta, so the operation had to be abandoned. In the second case the operation was completed without great difficulty, and I was surprised to find how easy it was to separate the esophagus with the finger behind the aorta and draw it up into the neck. The patient, however, did not survive. Dr. Lilienthal has since then removed a cancer of the esophagus through the posterior mediastinum.

In cases of diverticulitis, the method of doing the operation in two stages has naturally reduced the mortality, and Dr. Lahey's ingenious trick of twisting the stump undoubtedly helps to prevent leakage and makes the convalescence easier for the patient.

DR. CHARLES G. MIXTER, Boston: A number of years ago my father introduced the scheme of passing bougies through these bad strictures formed by pressure diverticula, using a thread as a guide, and that is very useful in the cases that are not suitable for operation. A number of these cases go on for years with the passage of bougies at two, three or four-week intervals and they can attend to their work and be comfortable. This is an example of the pressure diverticulum type (showing lantern slides of two cases). In this case there was a small sac, and unless we forced the sac to expand by stopping the pharynx, it was very difficult to find. That was a type of diverticulum which lent itself to the Bevan operation, and the operation was done in the following way: The sac was completely mobilized and invaginated on itself into the esophagus and the opening closed with several rows of catgut suture. The esophagus and the diverticulum are not opened in this operation. The patient noticed no difficulty in swallowing after operation. This operation can be done without infection and without leakage in one stage. (Lantern slide.) This is the diverticulum in the second case, and here is the arch of the aorta. That was in a man of forty-three. He had had a loss of weight for two years. He had had four attacks of so-called "flu," which I think were inhalation pneumonias. By free exposure I found it was a thick-walled sac; it freed with great difficulty. At the lower extremity I ruptured the sac and was forced to do a one-stage operation. I excised all except the base, infolded it and buried it with three lines of sutures. The postoperative course was stormy. On the fourth day he complained of pain in the scrotum, and we found a marked emphysema, and three days later he developed a fistula of the esophagus, and this closed in about three weeks, and after he went home it again opened, and finally closed permanently. I found that a low transverse incision was a very satisfactory exposure. Both of these diverticula occurred on the left posterior wall of the esophagus.

DR. FRANK H. LAHEY, Boston (closing). There is really nothing more to say except that invagination was spoken of as a method of treatment. The operation was devised by Bevan. There are disadvantages to this method. One is that if you have invaginated the sac, recurrence is apt to occur. Furthermore, Bevan has had one case in which during a coughing spell the invaginated portion rose up in the pharynx and threatened suffocation.

It is well to follow these cases afterwards because there is a tendency to recurrence, and it is well to follow up the operative treatment with dilatation of the upper part of the esophagus.

Book Reviews.

Functional Nervous Disorders. By DONALD E. CORE, M.D., M.R.C.P. Pp. xiii+371. New York: William Wood & Co. 1922.

This volume represents the new trend in neurology, that is, it discusses the neuroses from the dynamic and interpretive standpoint rather than that of the purely descriptive. Although we are not in complete agreement with all the author's views, yet the book is an admirable one for the physician who wishes to break away from the usual text-book descriptions of the neuroses.

The neuroses occupy a prominent position in contemporary medicine, as the major part of medical practice, both general and special, is concerned with patients suffering from nervous illness, and any contribution, such as this volume is, which breaks from the traditional drug and physiotherapeutic treatment and places the handling of the neuroses on a sound and rational psychotherapeutic basis, is very welcome. Today, any physician who interprets a neurosis from the purely physical standpoint or attempts to treat a case of nervous illness by drugs alone is liable to have his clinical ideas and therapeutics completely wrecked on the rocks of an outworn conception of etiology and therapy. For the neuroses are the disturbances of the emotional life; symbolically they represent inabilitys of adaptation to environment. They are really mental conflicts of the sexual and ego instincts, and their only rational treatment must be along psychoanalytic lines and not the psychotherapy of an unscientific suggestion or persuasion. In addition, these psychical conflicts react on the sympathetic nervous system and the ductless glands, thus only secondarily producing somatic symptoms, which are so often treated as primary disturbances.

The chief defect of the volume is an attempt by the author to force the complicated nervous disturbances into too rigid a classification, such as the regressive neuroses, comprising primary, secondary and tertiary hysteria and the progressive neuroses, under which are included the instinct-distortion-neuroses or dysthymic disorders and finally the mnemo-neuroses, the latter comprising the fear states and the obsessional forms. Such a classification is confusing and, instead of clarifying the subject, tends to complicate it. The summaries at the end of the chapter are well done and convenient for rapid reference.

Certain features of the volume, particularly the author's attitude toward psychoanalysis, do seem to be borne out by clinical experience. For instance, he places psychoanalysis under special methods of suggestion and states that the most efficient psychoanalytic method is a searching cross-examination. Now psychoanalysis is not

suggestion; its methods are directly opposed to suggestion and any element of suggestion is carefully avoided in analytic therapy when this is applied by a trained medical analyst. Secondly, to utilize the cross-examination method for analytic therapeutics is to miss the entire object of psychoanalysis, for such a method only tends to increase those resistances which are present in every neurosis, instead of removing them, as takes place when psychoanalysis is properly carried out through the method of free association. According to the author, the analytic treatment of hysteria is bad, and he feels that simple suggestion is the most satisfactory. Of course if psychoanalysis is synonymous with a cross-examination, we can conceive of no worse method for treating the hysterie, but when the analysis is properly carried out through the free associations to remove the resistances, the analytic method is the most satisfactory and radical method yet devised for the treatment of hysteria. Simple waking suggestion or hypnosis give only temporary effect in hysteria; psychoanalysis alone furnishes a permanent cure.

An interesting feature of the volume is the definition of hysteria as atavistic from the evolutionary standpoint, which has the same meaning as the psychoanalytic concept, *viz.*, that hysteria is a childhood reaction to an adult situation. According to the author, "Hysteria is a form of behavior in man which approximates most of that which obtains usually among the non-human animals." Fifteen years ago, Metchnikoff arrived at a similar conception of hysteria in the volume on "The Prolongation of Life," where he states that an hysterical somnambulist acts "like his anthropoid ancestors."

Clinical Symptomatology of Internal Diseases.
Part II. Generalized Pain. By PROF. DR. NORBERT ORTNER, Vienna. Only Authorized Translation into the English Language of the 2nd German Edition. By FRANCIS J. REBMAN, New York. Medical Art Agency.

The title of this volume is misleading, probably from its translation. The volume might better be entitled Non-abdominal Pain, since, as the reader soon sees, its real purpose is to cover all of the many local pains of all parts of the body except the abdomen, thus supplementing a previous volume on abdominal pain. It begins with pains in the heart and cardiac region, and ends with articular pains and headache. The scope of the work is therefore very large. To its discussion the author applies the results of

an obviously wide experience and a high degree of learning. The text consists of brief mention of an enormous number of pathological conditions capable of producing pain in the various locations, with hints as to their recognition. The reader receives the impression that conciseness of statement has been kept even too prominently in mind. Not a few of the matters discussed are not included in ordinary medical teaching, and in some of these one feels that the contents of a single paragraph might well furnish the material for a separate article. One reads, therefore, with the feeling that the importance and truth of certain of these condensed statements could be established with more clearness and vividness than the few sentences written convey. Occasionally, too, one reads with scepticism as to the practical possibility of recognizing pain in the individual case as caused by certain of the mechanisms described, as from neuritis of the phrenic nerve, and localized pericarditis adhesions. But in the latter the author himself honestly admits uncertainty. The book from its subject matter alone requires close concentration on the part of the reader to be understood. The difficulty of reading is further increased by the somewhat foreign-sounding diction of the translation, the excessive use of Latin and Latin-derived terms, and misprints, such as *vesicular* for *vascular*, and *desiccating* for *dissecting* aneurysm. Still the physician who will read it carefully, thoughtfully and with critical judgment will be well repaid for his effort in new suggestions as to the causes of obscure symptoms.

The Essentials of Chemical Physiology. By W. D. HALLIBURTON, M.D., LL.D., F.R.S., Professor of Physiology in King's College, London. Eleventh Edition. 343 pages. Longmans, Green & Co. 1922. Price \$2.50.

The eleventh edition of this well-known text book has been changed but little. It contains in very condensed form much of the chemical knowledge essential to the practicing physician and medical student. It contains a great many methods and an excellent laboratory manual for the chemical study of body tissues. As a result it is a good introduction to the study of physiology, but it is only an introduction. Like most books of this type it gives the impression that far more facts are finally established than seems justifiable in the light of more advanced knowledge; this tends to inhibit the scientific inquisitiveness of the reader. But this is a criticism of the type rather than of this particular volume, which fulfills its purpose very well.

Current Literature Department.

ABSTRACTORS.

GERARDO M. BALBONI	FRED S. HOPKINS
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JOHN S. HODGSON	WILDEB TILESTON
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PYELITIS IN PREGNANCY.

SEXTON (*Jour. of Urol.*, June, 1922) states that pyelitis occurs frequently in pregnancy and may easily be mistaken for appendicitis. It is probably due in main part to some form of ureteral obstruction producing an infection with *B. coli* as the most common organism found. It may occur at any time during pregnancy or in puerperium. Medical treatment with proper posture, forced fluids and urotropin give satisfactory results in mild cases. Catheterization of the ureters with pelvic lavage will produce brilliant and almost immediate results. Surgical intervention is practically never indicated unless there is a pyonephrosis, which in the majority of instances antedates the pregnancy and should not be considered as a pyelitis accompanying pregnancy. [B. D. W.]

A NEW SIGN IN THE DIAGNOSIS OF URETERAL STONES.

LEWIS (*Jour. of Urol.*, June, 1922), in using a ureteral catheter to note if shadow is in ureter or in line of ureter, states that in his experience this is not a definite diagnosis. The catheter being pliable follows the normal position of the ureter, then, as he suggests, a ureteral forceps is passed up the ureter, the ureter is straightened out and what apparently has been in contact with the catheter is now displaced. He gives a few plates to illustrate and feels that many of the symptoms simulating stone are many times ureteral stricture. This he shows in a few cases cited. [B. D. W.]

SACRAL ANESTHESIA IN PERINEAL PROSTATECTOMY.

CROWELL AND THOMPSON (*Jour. of Urol.*, July, 1922) state as follows:

1. The removal of the prostate gland under sacral anesthesia may be done as a routine and this form of anesthesia certainly should be taken advantage of in cases where a general anesthetic would be dangerous.

2. Young's operation (or its modifications) for the removal of the prostate offers the best drainage possible, is followed with fewer complications, requires a shorter stay in the hospital, gives greater comfort to the patient, causes less fatalities and gives as good permanent results as the suprapubic operation.

3. A summary of these 243 cases shows sufficiently good results to justify us in continuing this technic and recommending it to others. [B. D. W.]

THE VALUE OF BLOOD TRANSFUSION TO THE UROLOGIST.

MARTIN (*Jour. of Urol.*, August, 1922) says in addition to improving kidney function by establishing urinary drainage by whatever method desired, and instituting proper hygiene for the patient, the transfer of blood from a vigorously healthy donor to a weak, anemic, debilitated old man immediately vital-

izes him and thus greatly shortens the preparatory time. For it has been well established that transfused blood not only increases the quality of blood by its own addition but that it acts as stimulant to hemogenetic centers. It also increases the coagulability of the recipient's blood, which is always low in anemic conditions, thus reducing the liability to hemorrhages or excessive oozings. It is of especial value in preparing for operation patients suffering with kidney tumors who have been weakened and made anemic by hemorrhages.

In the postoperative treatment of shock, hemorrhages, oozings, and failure to rebound we have experienced blood transfusion to be a source of great help and satisfaction. In two cases of acute nephritis the results have been most satisfactory. It is in these cases that the author believes blood transfusion will serve best. Both were acute virulent cases with almost acute anuria. They are given in detail. [B. D. W.]

CARBUNCLE OF THE KIDNEY.

KRETSCHMER (*Jour. of Urol.*, August, 1922) says by carbuncle of the kidney is meant an infection of the kidney by staphylococci secondary to an infection elsewhere by this organism, such as a carbuncle or felon. It is to be differentiated from the acute, septic, or embolic kidney where the entire organ is flooded with small miliary abscesses. Two cases are reported: one unilateral and the other bilateral, in which the primary foci were demonstrable. General symptoms: chill, fever, loss of appetite, malaise, leucocytosis. The latter is always present, even as high as 27,000. Local symptoms: (1) pain in the region of the kidney, cramp-like or cutting; (2) localized tenderness, urinary symptoms. The urinary findings are usually insignificant because the lesion is at first confined to the parenchyma of the kidney and there is no communication with the pelvis. Treatment usually nephrectomy. [B. D. W.]

SURGERY OF THE PITUITARY GLAND.

WALTON (*Brit. Med. Jour.*, Nov. 4, 1922) in an article with various interesting plates and photographs discusses the development, anatomy, functions and pathology of the pituitary gland and its relation to gigantism, acromegaly and other conditions. He discusses the indications and technic of operative procedure and gives the details of six cases, with a good bibliography. [J. B. H.]

ETIOLOGY OF RICKETS AND TREATMENT OF TUBERCULOSIS OF THE CERVICAL GLANDS.

At the meeting of the Section of Diseases of Children of the British Medical Association (*Brit. Med. Jour.*, Nov. 4, 1922) there was a discussion of the etiology of rickets and one on the treatment of tuberculosis of the cervical glands. In the latter Fraser discusses the difference between the blood and lymphatic modes of infection and takes up the rôle played by the bovine type of bacillus, the questions of age and general condition of the patient as bearing on treatment, and discusses in brief the ideal treatment of tuberculosis of the cervical glands.

Both these discussions are important and valuable. [J. B. H.]

CARDIAC FAILURE.

HAY (*Brit. Med. Jour.*, Nov. 11, 1922) discusses the general subject of cardiac failure and various methods of treating it by drugs and other ways. [J. B. H.]

CONGENITAL HEART DISEASE AND ITS PROGNOSIS.

BELLINGHAM-SMITH (*The Practitioner*, Nov., 1922) summarizes his remarks on congenital heart disease as follows:

1. Post-mortem findings at a children's hospital show that the greatest mortality from congenital heart disease occurs before the age of two years.

2. Of the cases of congenital heart disease calling for medical treatment before two years of age, the majority will end fatally in infancy or early childhood.

3. The prognosis in children requiring medical attention after two years and before eight years of age is almost as bad, and though the immediate mortality is less, few will survive to early adult life.

4. The prognosis in (2) and (3) cannot be founded with any accuracy on the physical signs, but must be largely deduced from the symptoms present—wasting, ashen pallor, extreme cyanosis, convulsions, etc., being of grave significance, while good bodily development and absence of serious symptoms make the outlook more hopeful.

5. After eight years of age the general condition will still play a large part in the prognosis, but the physical signs at and after this age are generally of a fairly well-defined type, and a prognosis may be made of a more or less favorable character, according to the lesion present.

6. Finally, it has been shown that there are a number of cases of congenital heart disease in existence that have never called for, and may never call for, any medical treatment, and that consequently any prognosis founded solely on hospital experience is fallacious, in that it tends to attach too high a mortality to congenital heart disease as a whole. [J. B. H.]

THE INTERNAL SECRETION OF THE PANCREAS AND ITS APPLICATION TO THE TREATMENT OF DIABETES MELLITUS.

WALLIS (*The Lancet*, Dec. 2, 1922) discusses the internal secretion of the pancreas in relation to the general subject of diabetes with the following conclusions:

1. A preparation of the pancreas obtained by alcoholic extraction *in vacuo* has been made.

2. This extract, when given by the mouth, is capable of reducing the blood-sugar in certain cases of diabetes mellitus.

3. By reducing the blood-sugar it is possible to increase the patient's tolerance to carbohydrates.

4. The pancreatic extract is therefore useful as an adjuvant in treatment, particularly in cases of diabetes mellitus with complications, e.g., gangrene, threatened coma, etc.

5. The duration of treatment as well as the actual dosage is determined by the general condition of the patient, the blood-sugar, and the actual tolerance to carbohydrates. [J. B. H.]

THE RELATION OF CALCIFIED ABDOMINAL GLANDS TO URINARY SURGERY.

WACKER (*The Lancet*, Dec. 9, 1922) in an article illustrated with various x-ray plates discusses the general subject of calcified abdominal glands and the conditions under which they may lead to confusion in the diagnosis of various genito-urinary diseases, such as stone in the kidney and ureter, etc. [J. B. H.]

THE INFLUENCE OF SATURNINE COMPOUNDS ON CELL GROWTH.

BELL (*The Lancet*, Nov. 11, 1922), discussing the general problem of lead in cell growth, with special reference to the treatment of malignant neoplasms, summarizes his remarks as follows:

1. Lead enters into combination, probably chemical, with lecithin.

2. Lead affects those normal tissues of the body in which lecithin or similar lipins are present in greatest quantity.

3. Malignant neoplasms contain lecithin in direct proportion to their rate of growth (Bullock and Cramer).

4. Intravenous injections of a colloidal preparation of lead, while not without danger, can, with experience, be so regulated that little or no disturbance is caused.

5. After previous intravenous injection of a colloidal preparation lead can be recovered from the malignant growth in a quantity proportionately greater than that contained in the rest of the body.

6. Lead in suitable doses appears in nearly all cases to arrest the growth of malignant tumors. In some cases treatment with this metal may result in disappearance of the neoplasm, possibly by the action of the normal tissues on arrested cell developments. The probability of this appears to depend on the vascularity of the parts. At the same time there is improvement in the general condition.

7. It is desirable when possible that the bulk of the growth be removed, and that this procedure be followed immediately by the injections while there is increased blood supply to the part concerned.

8. Previous intravenous injections of a colloidal preparation of lead seem to increase the beneficial effect of x-rays, owing to the promotion of secondary radiation.

9. It is possible that prophylactic treatment after complete removal may be of considerable importance with regard to the prevention of recurrence.

10. This investigation, although much time and labor have been given to it for more than three years, and although the results obtained are very suggestive, must be regarded as still in an experimental stage. [J. B. H.]

OPERATION AS PART OF THE CONSERVATIVE TREATMENT OF POTT'S CARRIES.

WHEELER (*The Practitioner*, Nov., 1922) in a long article discusses the operative treatment of spinal tuberculosis with the following conclusions:

1. The conservative treatment of children is best without operation.

2. All adults, in the absence of special contraindications and who either cannot obtain or will not endure prolonged treatment by orthodox methods, should be given the benefit of operation.

3. The additional fixation obtained by a bone graft often determines cure in a patient who has not responded to the recognized non-operative treatment.

4. Whether the graft is introduced as originally recommended by Albee or laterally under the erector spinae muscles, firm union takes place bone to bone.

5. Abscesses, as a rule, disappear after operative fixation of the diseased spinal segment.

6. More rapid recovery frequently follows operation in cases of paraplegia.

7. An active primary tuberculous lesion is not *per se* a contraindication to operation.

8. Bone grafts absorb less frequently in spinal cases than elsewhere, probably owing to the fact that the bed for the graft consists of healthy bone.

9. The early recognition by x-ray photographs of destructive osteoclastic action should not be mistaken for commencing absorption. The simultaneous constructive activities of the osteoblasts do not become visible until a later date.

10. The electric saw does not cause injury to the graft and requires practice for its proper use.

11. Prudence dictates three months' postoperative treatment in bed, and rest should be advised until twelve months have elapsed. [J. B. H.]

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PUBLIC HEALTH IN NEW YORK STATE.

In his inaugural, according to the New York Times, Governor Smith says: "Activity by the State for the preservation of public health can never be too broad. While we may congratulate ourselves on the steadily diminishing death rate, we must not permit ourselves to slow down for a single moment any effort that the State should put forth for the protection of the public health and the prevention of disease. Too many people are prone to the idea that health is the concern of the individual. I believe it to be the business of the State, because the State itself cannot be healthier than its people."

As an academic proposition this statement appears to be sound, but since Governor Smith has taken the position that since New York pays a large portion of the Federal taxes it should take full advantage of the appropriation made by the Government to aid in public health work regardless of objections to such schemes, the question may be raised as to whether Governor Smith has a "broad" conception of health problems as applied to a state.

According to Governor Smith, the end justifies the means, and this principle carried far enough would lead a man to follow the example of Esau, who sold his birthright for a mess of pottage.

Subservience to many of the schemes for public health activities ought to make the medical profession place itself on record as opposed to the reasoning of penny-wise politicians. We have profound respect for those people who look upon public health laws as means for bettering the condition of our people, but to interpret such laws as provisions for pecuniary reward for doing work which should be done anyway is endorsement of the policy of paying a premium for good behavior. It may be necessary in dealing with immature minds but hardly fits our ideas of civic ethics.

We are thankful that Massachusetts prefers to stand on her own feet and does not consider herself dependent on Federal crutches. May she continue to maintain her self-respect!

COMMUNICABLE DISEASES AND TRAVEL.

THE United States Public Health Service has issued a bulletin by Thomas R. Crowder, M.D., on "Communicable Diseases and Travel." A number of interesting facts are brought out by Dr. Crowder which are of value and should be generally known, for considerable ignorance and superstition still exists concerning the communication of infectious diseases and the dangers from the transportation of those ill from them.

Contact infection may be brought about in many ways: by kissing, by coughing or sneezing in close proximity to another person, by drinking cups, by the deposit of sputum on floors, by sneezing or blowing the nose through the fingers, and by the mouthing of toys by children. Quiet breathing is not a source of danger. Fomites are of more importance than sneezing and coughing, but infected hands constitute the greatest menace. "A recent record by Palmer showed in a single ordinary day 92 opportunities for infecting his own hands directly by contact with other hands or with articles just handled by others, 14 opportunities for infecting himself from his own hands by carrying them to the nose or mouth, and 17 opportunities by carrying to his mouth articles possibly infected by others. According to Rosenau, probably 90 per cent. of all infections are taken into the body by the mouth from the hands with food and drink, by the droplets expelled in coughing, or directly by kissing and fondling."

Carriers and missed cases enormously complicate the problems of prevention, as does the travel of unknown cases. The control of communicable diseases on the railways involves: (1) supervision of the person who is known to be infected, either by preventing his traveling, or by such measures as will render his presence on a train harmless to others; (2) such measures of cleanliness and general hygiene as will render unlikely the indirect transfer of unknown

infection among travelers to healthy persons through the medium of such things as towels, drinking cups, and other objects of personal or common use; (3) the control of food and water supplied on trains and at stations.

It is difficult to decide which diseases should be excluded from common carriers and which ones should be permitted under proper restrictions, but Dr. Crowder believes that the conditions of safety are met by excluding from travel persons ill with any of the major quarantinable diseases—plague, cholera, yellow fever, typhus fever and smallpox. These diseases, although no more contagious and dangerous than others, are excluded because they are not generally endemic and their outbreak would introduce a new factor into a community.

Proper restrictions of the travelling conditions of persons ill with communicable diseases should include any or all of the following:

(1) Isolation of the patient in a separate compartment.

(2) The care of a responsible personal attendant.

(3) The disinfection of eating and drinking utensils.

(4) The disinfection of bodily discharges.

(5) Provision by the patient or his attendant of special facilities for carrying out these measures of disinfection and for preventing gross contamination of the car and its contents.

Crowder divides the diseases under consideration into six convenient groups as follows:

(1) Acute sputum-borne diseases.

(2) Acute fecal and urine-borne diseases.

(3) Pulmonary tuberculosis.

(4) Leprosy.

(5) Venereal diseases.

(6) Miscellaneous.

Laws proscribing the travel of lepers have undoubtedly been made too strict, owing to the universal prejudice against this group; on the other hand, it was decided for obvious reasons to leave out regulations for the travel of venereally infected persons in drawing up the Standard Railway Sanitary Code.

The uselessness of terminal disinfection of common carrying vehicles other than thorough mechanical cleansing, after all the communicable diseases except cholera, plague and smallpox, has been quite universally accepted in this country.

AN ATTACK ON THE BOSTON TUBERCULOSIS ASSOCIATION.

The Boston Tuberculosis Association has been sending cards to people for the purpose of giving opportunity, to all who may be inclined, to assist in the work of this organization. One card carries an application for membership and suggestion for contributions and the other sets forth the functions and needs of the Prender-

gast Preventorium, and on the reverse side the value of the Modern Health Crusade, Educational Material, a Directory of Tuberculosis Institutions, and the Lecture Bureau are set forth.

One set of these cards fell into the hands of a believer in chiropractic. This person comments on the matter presented on these cards in a most insulting and ridiculous manner. Under the heading, "Lecture Bureau," this person says that, "A Chiropractor does not need such provision, but takes off his coat and does it." As an example of other arguments advanced, the following is quoted: "This is a poor way for some of you gits to eke out a little profit, panhandling. It is high time that the public were informed, and be in position to know just why some of you bums are holding such offices. Not for them to be sure, but for the small gain that can be secured by methods, that if other people worked them on different lines, they would be held up for fraud. Personally, I have been through the mill of the so-called assistance that is offered sufferers. Since the time of the Chrys* there has been tuberculosis, cancer, syphilis,* and kindred diseases on earth, and medicine* yet has to show a single advance. Up to the present time, there is not known a single specific on any disease. A Chiropractor cured me. Put a few at work and you won't need hospitals."

On the outside of a small pamphlet enclosed with the cards with the title, "Chiropractic for Pulmonary Tuberculosis," this writer goes on to say, "Here are the goods, and they are showing 'every day and in every way' that they have the goods. Investigate at least and show that you are really interested in humanity. Suppose you put a few of them at work, having it understood that their beloved and only science known to eliminate the cause of disease, stand or fall by the results obtained, and then you will be doing a real act, and not have your name known as a grafter, and your gain by their misfortune. You may laugh at this, but I and thousands of others can testify to the mighty potency of this God-given science."

In the pamphlet the assertion is made that although research and experiment have been unlimited the cause of tuberculosis has not been ascertained within the ranks of the medical profession and that the advertised cures are worthless. The following quotation from the pamphlet sets forth the chiropractic belief: "Manifold experiments along chiropractic methods have absolutely proven beyond question of a doubt that the secret of the cause of tuberculosis and its removal lies within the boundaries of that science."

The explanation of the secret is in substance that the nerves carry vital energy from the brain to tissue cells and that if the nerve fibers passing to the lung are affected, the lungs are abnormal. "If there is an excess of expansion

*Spelling as it appears in the original.

impulses, then a tumor will develop. If an excess of heat impulses is expressed, then fever occurs. If nutrition and the ability to repair are deficient, and if heat is present in excess, then tuberculosis manifests itself."

The usual explanation of the causes of disease, according to chiropractic theories, is given, and consists of the assumption that displaced vertebrae impinge on the nerves and prevent the transmission of vital energy.

Under the section with the heading, "What To Do," the following illuminating advertising material appears: "The chiropractor is not only proficient in determining which bony segments are out of proper position, but he is also thoroughly trained in how to restore those segments to their normal state. This he does with the hands alone and without the use of any special instruments.

"When his work is accomplished, the pressure is removed from the nerve or nerves, and the lung being supplied with its normal quantity of vital energy is naturally restored to health. Case after case under the care of the chiropractor has proven this contention. To those who are suffering from tuberculosis and who see no hope in any other method, it is earnestly suggested that they consult with their local chiropractor, permit him to examine their spines, and then have those spines adjusted so that health may exist."

We cheerfully acknowledge the truth of the assertion contained in the pamphlet that several advertised cures are worthless, but we are just as ready to assert that the explanations and claims made in this pamphlet are as visionary as many of the products of disordered minds often observed in insane hospitals.

We are glad that the critic of the Boston Tuberculosis Association has recovered his health. We are sorry to find that any human being can be so deluded as to attempt a refutation of the work of a body of scientists who have accomplished great things in the care of unfortunates, the prevention of disease and inestimable addition to human efficiency and happiness. The criticism indicates a degree of malice and bigotry which would warrant suspicion of insanity, but the fact remains that a considerable proportion of the people are unable to reason logically and hence become the victims of fantastic propaganda. They have our sympathy because of their danger.

FURTHER FACTS ABOUT BACTERIUM PNEUMOSINTES.

The JOURNAL of February 15 made note of the fact that the lay press had recently heralded the discovery by Olitsky and Gates of the Rockefeller Institute of the causative organism

of influenza. That this announcement by the daily papers was somewhat misleading may be inferred from the perusal of a report by the discoverers of *Bacterium pneumosintes* themselves, published in *Science* on February 9.

Olitsky and Gates began their investigations into the bacteriology of influenza during the wane of the great epidemic of 1918-19. Pfeiffer's bacillus did not fulfill the criteria necessary to determine it as the causative organism of the disease, consequently further search was deemed necessary. Owing to the rapidity with which secondary organisms became implanted on influenzal soil, patients in the early stages of influenza were necessary to provide material for study. When such material was secured, during the first and second waves of the epidemic, animal experimentation was attempted, the infecting material used consisting of the nasopharyngeal secretions of those ill with the disease. The susceptibility of monkeys to various infections rendered them unsuitable for use, and the rabbit was then chosen as the experimental animal.

The virus was successfully passed through a series of animals by intratracheal injection, and was soon found to pass through earthenware filters impervious to ordinary bacteria. It was found to have other well known characteristics of filterable viruses, being resistant to drying and freezing and the action of 50 per cent. glycerol, although easily killed by heating. It survived contamination by molds and bacteria. A characteristic result of infection with the filterable virus was found to be a decreased pulmonary resistance to such common bacteria as the pneumococcus, streptococcus, and Pfeiffer's bacillus. Rabbits recovering from a primary infection with the virus were found to be immune to a subsequent inoculation.

The organism was eventually cultured with difficulty under anaerobic conditions, and was found to be a characteristic Gram negative body resembling the globoid bodies of poliomyelitis, but somewhat longer in one axis than in the other. The possibility of an immunity was demonstrated by the presence of agglutinins for this organism in the blood of persons recovered from influenza. Agglutinins were also found in the blood of seven among nine army volunteers who were vaccinated with killed cultures of the virus. In twelve of fifteen sera tested, precipitins were also found.

Clinically, the effect of the bacterium seems to be that it damages the lung in such a way as to lower its resistance to secondary invasion with ordinary bacteria. This property has led its discoverers to give it its name a bacterium that injures the lung.

This present report is not new and unexpected, nor do the authors make extravagant claims for their discovery. They still consider it as a preliminary report, bringing up to date preceding reports in the *Journal of Experimental*

mental Medicine in 1921 and 1922. In their own words "Apparently we are at the threshold of knowledge of a group or class of minute micro-organisms which the anaerobic Smith-Noguchi technique and more recently developed methods of cultivation have thrown open to exploitation. It has seemed wise, therefore, merely to report the experimental facts, and to defer decision of the precise relation which *Bacterium pneumoniae* bears to epidemic influenza until further experiment is obtained."

—
ART IN MEDICINE.

POETRY and the physician has recently been discussed in these pages; the influence of art on medicine, an analogous and harmonious union, and one of benefit to both science and art, or perhaps most fittingly, to both arts, is of at least equal importance.

"The Debt of Medicine to the Fine Arts" was, indeed, the subject of the presidential address of Dr. Nixon before the Bristol Medico-Chirurgical Society, lately published in the *Bristol Medico-Chirurgical Journal*.

"Progress was made in the art of medicine," we are told, "because the physicians of Greece shared with her poets and sculptors the same splendid faculties of keen sight and faithful reproduction of the thing seen." The theories of Hippocrates were speculative and frequently erroneous, but in his observation and description the instinct of the artist comes to the fore and gives us pictures that retain their accuracy to the present day.

The fifteenth century gave us Leonardo da Vinci, who "brought to the study of anatomy his unrivaled perception as an artist." Not only an anatomist of note himself, he also collaborated with the anatomist Della Torre by illustrating the celebrated anatomical treatise of the latter. Unlike many artists of his time who confused life and death in their illustrations, drawing their corpses and skeletons in animated postures, he always drew the dead as dead—the living as living.

At the time of Leonardo's death Vesalius was five years old. From the first this teacher availed himself of the assistance of the engraver and painter, selecting artists of the highest capacity and personally superintending their work. The plates which illustrate Vesalius' anatomy were executed by Johan Stephan von Calcar, a pupil of Titian, who also painted the portrait of Vesalius which is now the property of the Royal College of Physicians in London.

"Harvey's genius lay in his inimitable powers of artistic perception, not used for creative art or for mere illustration, but applied rather to accurate observation." He was an art critic of discernment, selected by the Earl of Arundel

to go to Italy "about some pictures for His Majesty."

In his "*De Generatione*" Harvey writes: "The things that have formerly been noted, and that by use or wont have become firmly fixed in the mind of the artist, do, in fact, constitute art and the artistic faculty: art indeed is the reason of the work in the mind of the artist.

"On the same terms, therefore, as art is attained so is all knowledge and science acquired; for as art is a habit with reference to things to be done, so is science a habit in respect of things to be known."

Willis employed Christopher Wren, who was himself an anatomist, to illustrate his anatomy of the brain. Anenbrugger, a musician and physician, discovered thoracic percussion. William and John Hunter were patrons of the arts, as was their friend Jenner, the country physician who admired the unscarred faces of the Gloucestershire maids and sought the reason.

Sir Charles Bell, discoverer of the functions of the spinal nerves, was a sketcher of merit; Pasteur was an artist before he became a chemist; Paget was an artist and a critic of music and painting. Greig Smith, one of the founders of abdominal surgery, modelled in clay. Charcot is spoken of as "the artist who went hand in hand with the physician, so that under his influence an artistic spirit came into being at the Salpêtrière, which reflected an unwanted luster on medical science."

"The happy conjunction of the artist and the scientist in the same individual," the author concludes, "is one of the chief factors which has transformed the healing art from mere magic into scientific medicine."

—
THE CHICAGO MEETINGS.

MARCH 5, 6 AND 7, 1923.

THESE annual meetings are among the important convocations of the year, consisting of joint meetings of the Council on Medical Education and Hospitals of the American Medical Association, the Council on Health and Public Instruction of the American Medical Association, the Association of Medical Colleges, the Federation of State Medical Boards of the United States, the American Conference on Hospital Service and the United States Public Health Service.

Dr. J. B. Blake and Dr. C. F. Painter were in attendance, representing the Massachusetts Medical Society, and Dr. Robert W. Lovett of Boston, chairman of a special committee, presented a report on Nursing Education and Service. Dr. Charles E. Prior represented the Board of Registration in Medicine. Other representative Boston men were: Drs. Rushmore, Begg, Arnold, Meaker, Worth, Hale, Rosenau and Faxon.

Our correspondent reports that 250 delegates registered.

Dr. Louis Wilson, Director of the Mayo Foundation, read an interesting report of the Committee on Graduate Medical Education, recommending standardization of graduate work and greater care in granting degrees.

Dr. Stanley Ryerson, Secretary of the Toronto Medical Faculty, suggested carrying anatomy, pathology and physiology, as well as medicine and surgery through four school years.

Dr. Lovett's report was presented and was followed by a minority report.

The session devoted to medical examination and licensure, as usual, brought out animated discussion.

In speaking of medical education the Dean of the Indiana Medical School expressed himself as pessimistic on the present curriculum in our medical schools because too much is taught. It would, in his opinion, be better to teach general medicine much more thoroughly.

The plans of some medical schools and hospitals were interesting features of the session on Medical Education. An admirable paper on "The Art of Medicine" was read by the Dean of the Nebraska School. Dr. Goldwater advocated non-medical clinical assistants in hospitals. This was endorsed by other speakers. Dr. John Lapp discussed the legal liability of hospitals. The relation of university hospitals to the profession proved an interesting topic for discussion.

President Wilbur of Leland Stanford advocated permitting the treatment of private patients by whole-time professors.

[NOTE: The attitude of Massachusetts in recent years has not been liberal in sending delegates representing the Board of Registration in Medicine to these meetings. This Board should be represented by the Chairman and Secretary at least, but this year the State Committee on Administration and Finance refused to authorize the attendance of even one representative of the Board of Registration in Medicine. The matter was presented to the Governor and he authorized the attendance of the Secretary of this Board at these meetings.

The work of the boards of medical registration have a definite influence on the quality of medical service rendered the people of a state, and high-grade medical ability is of inestimable value to every community, both from a personal and a public health standpoint.]

Additional reports will be furnished by our correspondent.

News Items.

DR. BRONSON CROTHERS was scheduled to speak before the section on Obstetrics and Gynecology, in coöperation with the Section of Pediatrics of the New York Academy of Medicine

on March 8, 1923. His subject was "The Intracranial Mechanism of Labor and Its Relation to Later Disabilities of the Child."

BOSTON'S DEATH RATE.—During the week ending March 3, 1923, the number of deaths reported was 326, against 322 last year, with a rate of 22.06. There were 55 deaths under one year of age, against 51 last year.

The number of cases of principal reportable diseases were: Diphtheria, 45; scarlet fever, 79; measles, 105; whooping cough, 84; tuberculosis, 29.

Included in the above were the following cases of non-residents: Diphtheria, 4; scarlet fever, 19; whooping cough, 2; tuberculosis, 2.

Total deaths from these diseases were: Diphtheria, 1; measles, 2; whooping cough, 3; tuberculosis, 19.

Included in the above were the following cases of non-residents: Diphtheria, 1; measles, 1.

HUMAN ACTINOMYCOSIS.—Dr. A. H. Sanford of the Mayo Clinic, Rochester, Minn., is engaged in a study of the distribution of human actinomycosis. Anyone having knowledge of such cases would confer a favor by reporting the facts to Dr. Sanford.

CHARTER FOR THE INCORPORATION OF THE MARY ARANDA MEMORIAL HOSPITAL.—On the afternoon of Thursday, March 1, a hearing was held before the Secretary of the State of Massachusetts in regard to the granting of a charter for the incorporation of the Mary Aranda Memorial Hospital. This hospital is to be under the direction of Dr. Francis A. Cave, who admits that he intends to employ the electronic methods of Abrams. The lawyer representing the incorporators of the hospital emphasized the fact that the incorporators were financially sound and maintained that even if it were admitted that the electronic method was to be employed, it was not within the province of the Secretary of State to refuse a charter for this reason. In opposition to this view, the State Commissioner of Public Welfare advanced the opinion that inasmuch as the electronic method was without scientific value and had been shown by investigation to be a fraud, it was within the power of the Secretary of State to withhold the charter. He called as witnesses in support of his opinion the following gentlemen: Drs. Calderwood and Prior of the State Board of Registration, Dr. John Bartol, Dr. James Stone, and Dr. George Gilbert Smith.

APPOINTMENT TO MEMBERSHIP ON THE MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE.—Governor Cox has appointed Dr. Henry L. Houghton, of 176 Commonwealth Avenue, Boston, as a member of this Board to fill the vacancy caused by the death of Dr. Perkins. Dr. Houghton was born in Worcester, Mass., grad-

uated from the Worcester Polytechnic Institute in 1889, and was instructor in Physics at Wesleyan, Middletown, Conn., for one year.

He graduated from the Harvard Medical School in 1894, served as house officer in the Massachusetts General Hospital and the Boston Lying-in Hospital, and in 1895 took a degree issued by the Philadelphia Post-Graduate School of Homeopathy.

He served as chairman of Medical Advisory Board 41-B in 1917-18.

In addition to a large practice Dr. Houghton has served as Trustee and Visiting Physician of the Massachusetts Homeopathic Hospital. He has qualified and will take up the work of this Board on his return from a trip abroad.

The Massachusetts Medical Society.

MEMBERSHIP CHANGES FROM JANUARY 1, 1923, TO MARCH 1, 1923.

OFFICIAL LIST.

Compiled by the Secretary.

ALPHABETICAL LIST.

Alfazar, Izak, Resigned, Feb. 7, 1923.
 Audet, Charles Henry, Resigned, Feb. 7, 1923.
 Bagnall, Elmer S., Groveland, now 281 Main St.
 Bean, Charles Pierce, Died at Boston, Jan. 12, 1923, aged 58.
 Beede, M. Josephine, Pasadena, Calif., 908 Denver St.
 Bennett, Hamlin P., Swampscott, now 72 Humphrey St.
 Bill, José P., from Middlesex South to Suffolk, Feb. 7, 1923.
 Bloombergh, Horace D., from Chestnut Hill to Andover, 5 William St.
 Boyd, James Francis, Resigned, Feb. 7, 1923.
 Bradford, Cary Carpenter, Retired, Feb. 7, 1923.
 Braverman, Aaron H., from Lowell to Washington, D. C., St. Elizabeth's Hosp.
 Breck, Samuel, Resigned, Feb. 7, 1923.
 Brigham, Edwin Howard, Retired, Feb. 7, 1923.
 Burnett, Nathan L., Cambridge, now 218 Columbia St.
 Caltritt, Constant, Lawrence, now 112 Haverhill St.
 Carr, Gladys Lydia, now Patterson, Gladys Carr, Dubuque, Iowa, 253 W. 10th St.
 Casey, Chester A., Ironton, Ohio, 11 Buckthorn St.
 Chamberlin, Harold A., office from 205 Beacon St., to 520 Commonwealth Av., Boston.
 Christian, Henry A., from Norfolk to Suffolk, Feb. 7, 1923.
 Churchill, Alice Symonds, Resigned, Feb. 7, 1923.
 Cleaves, Ezra Eames, Rockport, now 38 Main St.
 Cleaves, Helen F. T., Resigned Feb. 7, 1923.
 Clement, George W., Retired Feb. 7, 1923.
 Cohen, Samuel Adams, Resigned, Feb. 7, 1923.
 Cosgrove, Joseph Justin, from Framingham to Horse Shoe Station, N. Y., U. S. Vets. Mt. Camp.
 Crocker, Susan Elizabeth, Died at Los Angeles, Calif., July 15, 1922, aged 87.
 Currier, Cyrus R., from New Haven, Conn., to U. S. Navy, Med. Corps, c/o Postmaster, New York City.
 Cutler, Irving Taylor, Resigned, Feb. 7, 1923.
 Dadmun, Eliza Josephine, Boston, Hotel Brunswick.

Day, Charles Orrin, from Hingham to Boston, 483 Beacon St.
 Day, Hilbert Francis, from Middlesex South to Suffolk, Feb. 7, 1923.
 Deal, Edward Elvin, Died at Winchester, Jan. 20, 1923, aged 58.
 Donahue, Hugh, Haverhill, now 191 Merrimack St.
 Duffy, James Joseph, from New York City to Jersey City, N. J., 47 Duncan St.
 Dunn, Charles Hunter, Resigned Feb. 7, 1923.
 Edes, Robert Thaxter, Died at Springfield, Jan. 12, 1923, aged 84.
 Everett, Willard Shepard, Died at New York City, Jan. 31, 1923, aged 91.
 Flynn, Henry Lawrence, from Jamaica Plain to Dorchester, 713 Dudley St.
 Foot, Nathan C., Cincinnati, Ohio, 1 Interwood Place.
 Fountain, Oliver Reynolds, Lynn, 502 Essex St. Reserved by Council, as of Feb. 7, 1923.
 Fuller, Daniel Hunt, Resigned, Feb. 7, 1923.
 Galeani, Ilia, San Francisco, Calif., 655 Stockton St.
 Galligan, Eugene Thomas, Retired, Feb. 7, 1923.
 Garland, Roy, Deprived of the privileges of fellowship, Feb. 7, 1923.
 Gavin, John H., Retired, Feb. 7, 1923.
 Glickman, Alfred M., from Springfield to Long Branch, N. J., Monmouth Memorial Hospital.
 Gosine, Harold L., Resigned, Feb. 7, 1923.
 Granger, Frank Butler, from Middlesex South to Suffolk, Feb. 7, 1923.
 Gray, George Henry, from Lynn to Hyannis.
 Greely, Hugh Payne, Madison, Wis., 304 Gay Building.
 Gurjian, Leon K., Lynn, now 9 South St.
 Hall, Herbert James, Died at Marblehead, Feb. 19, 1923, aged 52.
 Ham, Helen Willard, now North Middleboro, office Middleboro, 65 Center St.
 Hamilton, Wallace F., from Wellesley to Wellesley Hills, 334 Washington St.
 Hanson, William Greene, Died at Everett, Dec. 18, 1922, aged 65.
 Harris, Paul Leon, from Ellis Island, N. Y., to Philadelphia, Pa., St. Luke's Hospital.
 Hatt, Ednah Swasey, from Salem to Honolulu, H. I., Hatt, Rafe Nelson, P. O. Box 2366.
 Hinckley, James William, Died at Brookline, Feb. 7, 1923, aged 65.
 Hogan, Charles Henry, Jr., from Salem to Brooklyn, N. Y., St. Mary's Hospital.
 Holden, Willard Daniel, Resigned, Feb. 7, 1923.
 Hood, Mary Gould, from Meredith, N. H., to Lincoln, P. O. Box 145.
 Hooper, George Henry, from Boston to Tampico, Mexico, William Gorgas Hosp.
 Howard, Eugene Henry, Died at Pittsfield, Jan. 19, 1923, aged 49.
 Howard, Herbert Handy, from Somerville to Boston, 24 Marlborough St.
 Irwin, Vincent Joseph, Retired, Feb. 7, 1923.
 Jensen, William C., Temporary address: Dayton, Ohio, Nat'l Military Home.
 Johnson, Charles F., Newburyport, now 61 Washington St.
 Johnson, Eric St. John, from New Bedford to Boston, 22 Chestnut St.
 Johnstone, William Joseph, Died at Jamaica Plain, Feb. 13, 1923, aged 59.
 Jones, Lyman Asa, Swampscott, now 260 Humphrey St.
 Jordan, Frank Herbert, Resigned Feb. 7, 1923.
 Kandib, Anna Hilda, from Dorchester to Algiers, La., U. S. Vet's Hosp., No. 84.
 Kewer, Leo T., from Mattapan to Boston, 28 Westland Ave.
 Kilbourn, Arthur Goss, Deprived of the privileges of fellowship, Feb. 7, 1923.

Livingston, William Kenneth, Resigned, Feb. 7, 1923.
 Looney, Joseph Michael, Resigned, Feb. 7, 1923.
 MacIntyre, William Angus, from Washington, D. C., to Tewksbury State Infirmary.
 MacIver, George Albert, from New Haven, Conn., to Boston, Mass. Gen'l Hosp.
 MacKnight, Richard Patton, from Fall River to Attleborough, Bristol County Tuberculosis Hospital.
 MacKnight, William Frank, Fall River, P. O. Box 907.
 Macomber, Donald, from Middlesex South to Suffolk, Feb. 7, 1923.
 Marchand, Eleanore G. } Salem, now 159 Lafayette St.
 Marchand, Jean C. }
 Marcy, Henry Orlando, Retired, Feb. 7, 1923.
 Mason, Broadstreet H., from Worcester to Peter Bent Brigham Hospital. From Norfolk to Suffolk, Feb. 7, 1923.
 McCradden, Francis Henry, from Roxbury to Jamaica Plain, office Boston, 512 Commonwealth Av.
 McDonald, John Francis, Lynn, now 151 Chestnut St.
 McQuaid, Thomas B., Everett, now 42 Norwood St.
 Mella, Hugo, from Norfolk to Suffolk, Feb. 7, 1923.
 Mellen, Eleanor Way Allen, from Middlesex South to Suffolk, Feb. 7, 1923.
 Menard, Leon J., Fall River, now 322 Oliver St.
 Monette, Camille J., Taunton, now 419 Bay St.
 Munro, Walter Lee, Retired, Feb. 7, 1923.
 †Nichols, Arthur Howard, Died at Boston, Jan. 9, 1923, aged 82.
 Nicholson, Minnie J. C., Haverhill, now 693 Main St.
 Novack, Herman Allan, from Boston to Dorchester, 4 Maybrook St.
 Nute, Albert J., Jamaica Plain, Office East Boston, U. S. P. H. S., 257 Marginal St.
 Oeser, Paul R., Lawrence, now 270 Jackson St.
 Page, Albert Kidder, from Boston to Arlington Heights, 122 Park Ave.
 Perry, Charles Eugene, from Hartford, Conn., to Glencliff, N. H.
 Perry, Henry Joseph, from Norfolk to Suffolk, Feb. 7, 1923.
 Pettingill, change to Pettengill, Warren Martin, Lawrence, U. S. Vet's Bureau, 37 Whitman St.
 Piper, Frank, from Middlesex South to Suffolk, Feb. 7, 1923.
 Rabe, Edith Ruth Meek, Boston, Hotel Touraine.
 Richards, Cyril Godfrey, Resigned, Feb. 7, 1923.
 Roe, John Cornelius, temporary address: Philadelphia, Pa., 1152 Marlyn Rd.
 Rowley, Philip W., Gloucester, now 15 Dale Ave.
 Schön, Edward, Lynn, now 180 Summer St.
 Schwab, Emanuel, Cincinnati, Ohio, 2532 Woodburn Ave.
 Segal-Roitman, Jennie, Winthrop, 47 Washington Av.
 Sharp, Benjamin S., from Boston to Washington, D. C., St. Elizabeth's Hosp.
 Shim, Philip A., from Gloucester to Perryville, Md., U. S. Vet's Hosp. No. 42.
 Shulman, David Hermann, Dorchester, 106 Glenway St. Restored by Council, as of Feb. 7, 1923.
 Silberg, Morris A., Roxbury, now 472 Warren St.
 Smith, Lillian Richardson, Lawrence, now 248 Broadway.
 †Smith, Samuel Finlay, Died at Indian Orchard, Jan. 22, 1923, aged 75.
 Smith, Stafford Baker, Died at New York City, Feb. 29, 1920, aged 36.
 Smith, William Lord, Resigned Feb. 7, 1923.
 Standish, Myles, Retired, Feb. 7, 1923.
 Stickney, Clifford W., Retired, Feb. 7, 1923.
 Stokes, Leroy T., Haverhill, now 190 Main St.
 Stone, Frank Ellsworth, Lynn, now 542 Western Ave.
 Stone, Thomas Newcomb, Haverhill, now 3 Washington Sq.
 Sullivan, Russell Francis, from Boston to Melrose, Office Boston, 240 Newbury St.

Temple, William Franklin, Retired, Feb. 7, 1923.
 Thompson, Howard King, Boston, Mass. Homeopathic Hospital.
 Tobey, George Loring, Jr., from Norfolk to Suffolk, Feb. 7, 1923.
 Turner, William Kenneth, Resigned, Feb. 7, 1923.
 Viets, Henry Rouse, from Middlesex South to Suffolk, Feb. 7, 1923.
 Wainschel, Percy W., Lynn, now 92 South Common St.
 Watters, William Henry, from Norfolk to Suffolk, Feb. 7, 1923.
 Webster, George Arthur, Resigned, Feb. 7, 1923.
 Wetherbee, Roswell, Retired, Feb. 7, 1923.
 Weyher, Russell F., Detroit, Mich., 2484 Chicago Boulevard.
 White, Herbert Warren, Retired, Feb. 7, 1923.
 Williamson, Cordelia Isabella, London, Eng., London Circus, E. C. 4.
 Winn, Charles Henry, from Roxbury to Newton Center, Office Boston, 50 Congress St.
 Wood, Russell, from Boston to New Bedford, 117 Cottage St.
 Worth, Edward Philip, Edgartown, now North Water St.
 Young, Ernest Boyen, Died at Boston, Jan. 17, 1923, aged 53.
 Zarella, Angelo M., Lynn, now 234 Chatham St.

◆◆◆
Obituary.

NELSON CLIFTON DAVIS, M.D.

ON March 2, 1923, DR. NELSON CLIFTON DAVIS of Winchester died in New York. He was born in Providence September 13, 1882. He was educated in Providence and the Maryland Nautical Schools. He received the A.B. degree from Harvard College in 1905, and M.D. from the Harvard Medical School in 1909. Dr. Davis specialized in bacteriology and later was given charge of H. P. Hood & Son's laboratories and was soon promoted to the position of managing director in that company. He was regarded as an authority on milk. His parents, Mr. and Mrs. Nelson S. Davis, a widow and two daughters survive him.

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FREDERICK TIGH, M. D.

DR. FREDERICK TIGH died at his home in Newburyport, March 2, 1923, after a brief illness of pneumonia, at the age of 61 years. He was born in Peabody, graduate of the class of 1889 of the Harvard Medical School and soon after began the practice of medicine in Newburyport. He was a member of the staff of the Anna Jaques Hospital, a member of the Essex North District Medical Association, the Massachusetts Medical Society and the American Medical Association. He was the physician to Newburyport lodge of Elks and was a fourth degree member of the Knights of Columbus.

He was a singer of much ability. He is survived by a widow and three daughters.

RESOLUTIONS ON THE DEATH OF
DR. EUGENE HENRY HOWARD.

Adopted by the Berkshire District Medical Society.

Eugene Henry Howard was born in North Brookfield April 29, 1873. Died January 19, 1923. He was next to the youngest of a family of eleven children. Educated at the schools in North Brookfield, graduated from the High School, A. B., Holy Cross in 1894; M. D., Harvard, in 1898. Joined the Massachusetts Medical Society in the same year, coming to Pittsfield in the fall, where he occupied an office in the Merrill Building from that time to his death. He was not married. President of the Berkshire District Medical Society in 1915 and Vice President in 1914. Censor in 1920 and 1921. He was a member of the staff of the House of Mercy in 1903. On the organization of the Boylan and St. Luke's Hospitals he acted as Medical Director of those institutions.

In 1915 he had charge of the Tuberculosis Clinic of the Pittsfield Board of Health.

In 1910 he was appointed school inspector and acted for the city since that time with three other physicians. As expert witness he served for the New York, New Haven & Hartford Railroad and the Berkshire Street Railway. He was a member of the Knights of Columbus, Forsters of America and St. Joseph's Church.

He acted as Grand Knight in 1909 and District Deputy Grand Knight in 1911, of the Knights of Columbus.

About ten years ago Dr. Howard found that he was carrying a high blood pressure. The removal of his tonsils and a long rest seemed for a time to improve his condition, but only for a time. With a grim cheerfulness he recognized the symptoms of vertigo, slight aphasia, etc., and when serious symptoms developed Wednesday evening, while he was putting up his car, he must have known what was coming.

His friend and associate, Dr. John Sullivan, saw him at his office and assisted him in going to the Boylan Hospital. Coma came on Thursday morning and he died without gaining consciousness, on Friday. His funeral was held at St. Joseph's Church on Saturday, with burial at North Brookfield on Monday, January 22.

We are thankful that he was spared a long period of incapacity and suffering.

"Cowards die many times before their death;
The valiant never taste of death but once.
Of all the wonders that I yet have heard,
It seems to me most strange that men should

fear;

Seeing that death, a necessary end,
Will come when it will come."

Miscellany.

THE AMERICAN SOCIETY FOR THE CONTROL OF CANCER.

THE tenth annual meeting of the American Society for the Control of Cancer, and its first annual meeting since its incorporation last May, was held on March 3 in the Society's rooms in the Pennsylvania Terminal Building.

Following a brief session by the Executive Committee, at which the finance and membership reports were read and accepted and the budget for the present fiscal year was submitted, the Committee reported to the members as a whole.

At the meeting of the members, Dr. Howard C. Taylor, Calvert Brewer of the U. S. Mortgage & Trust Company, Thomas M. Debevoise and Mrs. Robert G. Mead were elected members of the Board of Directors for the ensuing year.

Dr. Edward Reynolds of Boston was named as chairman of the Advisory Council, and Drs. Clement Cleveland, Livingston Farrand of Ithaca, George E. Armstrong of Montreal, and Dr. Rudolph Matas of New Orleans as vice-chairmen.

Dr. LeRoy Broun reported the membership of the Society to be approximately 2500. This shows a substantial growth during the last year. The budget as prepared by the Executive Committee, and later accepted by the Board of Directors, calls for the expenditure of approximately \$50,000 during the next fiscal year.

The newly elected Board of Directors, at its meeting, elected Dr. Howard C. Taylor of New York, Vice-President of the Society; Calvert Brewer, Treasurer, and Thomas M. Debevoise, Secretary. No action was taken to fill the vacancy caused by the death of Dr. Charles A. Powers of Denver, the Society's President, who died last December.

The Board elected the following as members of the Executive Committee: Dr. Howard C. Taylor, chairman; Calvert Brewer, Mrs. Samuel Adams Clark, Dr. Clement Cleveland, Thomas M. Debevoise, Dr. Haven Emerson, Dr. John C. A. Gerster, Dr. Howard Lilienthal, Mrs. Robert G. Mead, Dr. George H. Semken and Dr. Francis Carter Wood, of New York; Dr. Joseph Colt Bloodgood and Dr. Thomas S. Cullen, of Baltimore, Dr. Robert B. Greenough and Dr. Edward Reynolds, of Boston; Dr. Frederick L. Hoffman of Wellesley Hills, Massachusetts; and Curtis E. Lakeman of Albany.

During the meeting of the Society as a whole, 85 members of the Advisory Council were elected to serve one year. Those names include many of the country's foremost physicians, surgeons and scientists, as well as a large number of prominent lay citizens who are interested in

the Society's work. The Council members are drawn from about 35 of the principal cities in the United States and Canada.

During the evening the members of the Advisory Council and State and Regional Chairmen met at the Hotel McAlpin and discussed the Society's work at length.

A most interesting conference of those active in the work of the American Society for the Control of Cancer was held at the Hotel McAlpin Saturday evening, March 3. All expressed the utmost confidence in the ultimate success of the Society's efforts to control cancer by educating the public.

Special mention was made of the willingness of newspapers to coöperate by devoting valuable space to popular news articles carrying cancer facts.

"It was decided," said Frank J. Osborne, Executive Secretary of the Society, "to continue in much the same way that the Society had conducted its work during the past two years, so it is probable that an attempt will be made to reach more people more effectively by organizing and carrying out a series of campaigns in states grouped into districts, as a variation of the National Cancer Week. In this way more intensive work can be done, and the campaign, when begun in the fall, should be continuous in different parts of the country throughout most of the year."

THE ADMISSION OF VOLUNTARY PATIENTS TO HOSPITALS FOR THE INSANE.

Dr. Kline, Commissioner of Mental Diseases, has, according to the *Boston Herald*, formulated the following regulations for the admission of voluntary patients to hospitals for the insane:

That no person shall be admitted as a voluntary patient who can be regularly committed by the courts as an insane patient.

That no minor shall be received as a voluntary patient in any asylum.

That no patient shall be admitted as a voluntary patient unless he or she is fully competent to understand the conditions of admission and unless fully aware of the fact that immediate release can be secured on request.

That every person admitted as a voluntary patient must first have signed his or her own admission petition.

That if at any time the patient signifies his or her desire to leave, the officer must at once supply the patient with a written application for release.

THE INFLUENZA VIRUS.

SIR SPENCER LISTER, according to *The British Medical Journal*, has confirmed the presence of

a filter-passing virus in influenza, as reported by Olitsky and Gates of the Rockefeller Institute. His observations have been described in the *South African Medical Record* of November, 1922.

Although, during the pandemic of 1918, while working in Johannesburg, he was unable to determine the presence of a filterable virus, he has now succeeded in obtaining a culture of the filter passer in five out of fifteen cases by sowing the vaso-pharyngeal washings in Noguchi medium. Loefler's alkaline methylene blue has been found most successful for demonstrating the presence of the organism. The disease has been produced experimentally by spraying the noses and throats of volunteers with the unaltered culture.

Sir Spencer Lister points out that this result is not sufficiently conclusive to establish the filter passer as the cause of influenza, but taken in conjunction with Olitsky and Gates' work, it is distinctly encouraging.

THE CRAWFORD W. LONG STATUE.

For two months past the physicians of Georgia have been trying to raise ten thousand dollars for the purpose of placing a statue of Dr. Crawford W. Long in the Hall of Fame in Washington. The profession in Georgia has long contended that Dr. Long was the discoverer of ether narcosis and should have been recognized rather than William T. G. Morton.

The present drive has not yet raised sufficient funds to carry out this purpose.

THE MEDICAL WOMAN'S NATIONAL ASSOCIATION.

This organization will hold its annual meeting in San Francisco, June 25, 26, 1923. The number of women physicians in the United States is approximately eight thousand. New York had in 1920, 923; California, 808; Illinois, 749; Pennsylvania, 581, and Massachusetts, 530.

NEW AND NON-OFFICIAL REMEDIES.

During February the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-Official Remedies:

Eli Lilly and Co.—Schick Test and Schick Test Control.—Eli Lilly & Co. Diphtheria Toxin-Antitoxin.—Eli Lilly & Co.

H. K. Mulford Co.—Pneumococcus Antibody Solution, Types I, II, and II, Combined.—Mulford.

Parke, Davis & Co.—Diphtheria Toxin and Control for the Schick Test.—P. D. & Co. Neo-

Silvol. Mercurosal. Tincture No. 111, Digitalis.—P. D. & Co.

Yours truly,

W. A. PUCKNER, *Secretary,*
COUNCIL ON PHARMACY AND CHEMISTRY.

WEEKLY HEALTH INDEX,
DEPARTMENT OF COMMERCE,
WASHINGTON.

SUMMARY, WEEK ENDING FEBRUARY 3.

Telegraphic returns from 70 cities with a total population of 29,000,000 for the week ending February 3 indicate a mortality rate of 16.3, as against 15.3 for the corresponding week of last year. The highest rate (27.3) appears for Camden, N. J., and the lowest (7.8) for Duluth, Minn. The highest infant mortality rate (199) appears for Camden, N. J., and the lowest (25) for Tacoma, Wash.

Influenza and pneumonia are still prevalent. This week 15 cities show rates of 20 and over per 1000 population, whereas for the corresponding week of last year 9 cities had such high rates.

Deaths from pneumonia (all forms) for week ending

	1922												1923											
	Nov.	Nov.	Nov.	Nov.	Dec.	Dec.	Dec.	Dec.	Jan.	Jan.	Jan.	Jan.	Feb.											
Boston.....	4	11	18	25	2	19	16	23	30	6	13	20	27	3										
Boston.....	28	27	29	30	26	37	32	34	57	54	64	70	63											
Cambridge.....	3	3	1	1	3	8	12	9	6	7	12	15	15											
Fall River.....	2	4	3	4	4	8	4	5	1	11	6	3	7											
Lowell.....	5	2	4	3	4	2	4	1	5	7	4	6	11	10										
Lynn.....	2	2	1	1	4	2	3	3	7	3	6	1	14	6										
New Bedford.....	1	2	3	6	3	6	5	4	8	9	7	3	21	14										
Springfield.....	2	8	1	5	8	3	2	11	6	6	4	3	7	8										
Worcester.....																								
Deaths from influenza for week ending																								
Boston.....	2	1	1	8		1	9		8	1	14		1											
Cambridge.....					1					1		2												
Fall River.....										0	1	0												
Lowell.....																								
Lynn.....																								
New Bedford.....																								
Springfield.....																								
Worcester.....																								

SCHICK TOXIN-ANTITOXIN ACTIVITIES OF
BOSTON HEALTH DEPARTMENT.

May 6, 1922, to February 1, 1923.

PRE-SCHOOL AGE.

Schicks	Read	Pos.	P. C.	Pseudo	Neg.	1st	2nd	3rd	T.A.T. INJECTIONS
PRE-SCHICKS									
INCOMPLETED CASES									
796	708	64	5	118	521	69	67	52	
342	204	53	11	46	94	36			
29,224	27,240	12,284	1,553	3,951	9,452	12,662	11,475	10,610	
30,362	28,182	12,401	1,569	4,115	10,067	12,949	11,639	10,785	
COMPLETED CASES									
GRAND TOTAL									

Immunity produced by active immunization with
T. A. T., 90.2%.

JOHN A. CECONI, M.D.,
Epidemiologist.

NOTICES.

THE NEW ENGLAND SOCIETY OF PSYCHIATRY.

The New England Society of Psychiatry will hold its semi-annual meeting at the Foxboro State Hospital on April 11, 1923. Papers will be presented by Dr. O. J. Raeder and Dr. C. Macfie Campbell.

UNITED STATES CIVIL SERVICE EXAMINATION.

ASSISTANT TOXICOLOGIST, \$1800 TO \$2500 A YEAR.
March 29, 1923.

The United States Civil Service Commission announces an open competitive examination for the position listed above. Vacancies in the Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., at the salaries indicated, and in positions requiring similar qualifications at this or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

MASSACHUSETTS TUBERCULOSIS LEAGUE.

ESTIMATED BUDGET FOR 1923.

Staff Salaries:

Executive Secretary	\$3,600.00
Field Secretary	3,120.00
Educational Secretary	2,000.00
Assistant Secretary	1,600.00
Publicity Secretary	600.00
 Stenographic Service	\$10,920.00
Clerical Service	2,784.00
Traveling	150.00
Rent	1,900.00
Light	35.00
Office Supplies	500.00
Office Equipment:	
Files	\$70.00
Cupboards for stock room	100.00
Complete payments on typewriter	70.00
 Postage and Express	24.00
Modern Health Crusade:	600.00
Advertising sample material and stock.	
Health Educational Literature	400.00
Telephone and Telegraph	200.00
Annual Meeting	400.00
Committee Expenses	100.00
Nursing Lectures	100.00
Health Journal	75.00
Incidentals:	1,600.00
Sundries	\$199.90
Membership Dues in National Association	25.00
 Membership Campaign	224.99
Library Fund	750.00
Film	200.00
Seal Sale of 1923	100.00
 —	6,000.00
 SOCIETY MEETINGS.	\$28,978.99

The annual meeting of the Massachusetts Medical Society will be held in Pittsfield, June 12 and 13.

DISTRICT SOCIETIES.

A list of society meetings is herewith published. This list will be changed on information furnished by the secretaries of the societies, and will appear in each issue.

Barnstable District—Hyannis, May 4, 1923.

Bristol South District—Fall River, May 3, 1923.

Essex North District—Lawrence, Y. M. C. A. Building (Annual Meeting), May 2, 1923.

Meetings of the Suffolk District and the Boston Medical Library at the Library:

March 28, 1923—Surgical Meeting. "A Review of What Surgery means in the Disease of the Thoracic Organs, with a Forecast of the Future." Dr. Howard Littleton of New York.

April 25, 1923—Annual Meeting. Election of Officers. "The Record of the Past Twelve Years in Syphilology, with a Forecast of the Future." A series of 10-minute papers. Dr. C. Morton Smith, Boston, will preside.

The Springfield Academy of Medicine meets the second Tuesday of each month. Schedule of speakers includes the following names: Dr. Alan Carter, Dr. W. H. Long, Dr. W. Williams, Dr. W. S. Thawer, and Dr. Barton Cooke, hist. The date for each speaker has not been assigned.

Middlesex East District:

March 21, 1923—Mental Factors in Childhood. Paper by Dr. William Healy.

April 18, 1923—Interpretation of Laboratory Findings. Papers by Dr. E. G. Cradock and one to be announced later.

May 9, 1923—Annual Meeting.

All meetings except the Annual Meeting will be held at the Harvard Club in Boston. A. E. Small, Secretary.

Worcester District meetings are scheduled as follows:

April 11, 1923.—The meeting will be held at Memorial Hospital at 8:15 P. M., and the program will consist of a series of papers by members of the staff.

May 9, 1923.—Annual Meeting and banquet.

STATE, INTERSTATE AND NATIONAL SOCIETIES.

NEW ENGLAND PEDIATRIC SOCIETY.—The following are the dates for meetings of the coming season. Each meeting is on the second Friday of the month at the Boston Medical Library: March 9, April 13 and May 11.

March, 1923—Massachusetts Society of Examining Physicians (date and place undecided); Hilbert F. Day, Secretary.

March, 1923—Boston Association of Cardiac Clinics. Meeting March 15, 1923, at 8 P. M., Boston City Hospital.

April, 1923—New England Dermatological Society meeting, April 11, 1923, at 3 P. M., in the Surgical Amphitheatre, Boston City Hospital; C. Guy Lane, Secretary. Massachusetts Association of Boards of Health, April 26, 1923, Boston; W. H. Allen, Mansfield, Mass., Secretary.

April, 1923—Boston Medical History Club will meet the third Monday of each month.

May, 1923—Massachusetts Society of Examining Physicians (date and place undecided). American Pediatric Society meeting, May 31, June 1 and 2, 1923, at French Lick Springs Hotel, French Lick, Ind.; H. C. Carpenter, Secretary.

May, 1923—Boston Association of Cardiac Clinics. Meeting May 17, 1923, at 8:15 P. M., Children's Hospital. Subject: Rheumatism and Chorea and Heart Disease.

June, 1923—American Medical Association, San Francisco, June 25-29, 1923; Olin West, Chicago, Ill., Secretary.

July, 1923—Massachusetts Association of Boards of Health, July 26, Nantasket; W. H. Allen, Mansfield, Mass., Secretary.

CASES REPORTED TO MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH.

WEEK ENDING FEBRUARY 24, 1923.

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis	1	Ophthalmia neonatorum	38
Chicken-pox	153	rum	240
Diphtheria	177	Pneumonia, lobar	327
Dog-bite requiring anti-rabic treatment	6	Scarlet fever	327
Encephalitis lethargica	4	Septic sore throat	1
Epidemic cerebrospinal meningitis	4	Syphilis	49
German measles	10	Tetanus	1
Gonorrhoea	84	Trachoma	1
Influenza	428	Tuberculosis, pulmonary	122
Measles	1106	Tuberculosis, other	20
Mumps	147	Typhoid	8
		Whooping cough	369

WEEK ENDING MARCH 3, 1923.

Disease	No. of Cases	Disease	No. of Cases
Chicken-pox	146	Mumps	211
Anterior poliomyelitis	2	Ophthalmia neonatorum	35
Diphtheria	123	rum	247
Dog-bite requiring anti-rabic treatment	4	Scarlet fever	317
Encephalitis lethargica	6	Pneumonia, lobar	24
Epidemic cerebrospinal meningitis	3	Tuberculosis, pulmonary	111
German measles	6	Tuberculosis, other	19
Gonorrhoea	81	Typhoid fever	5
Influenza	257	Whooping cough	377
Malaria	2		
Measles	893		

SPECIAL NOTICE

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